

# AUTOMOTIVE INDUSTRIES

## THE AUTOMOBILE

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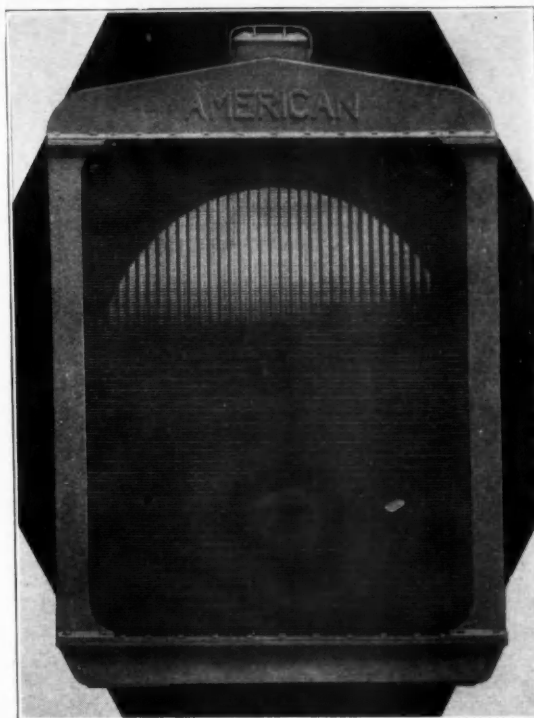
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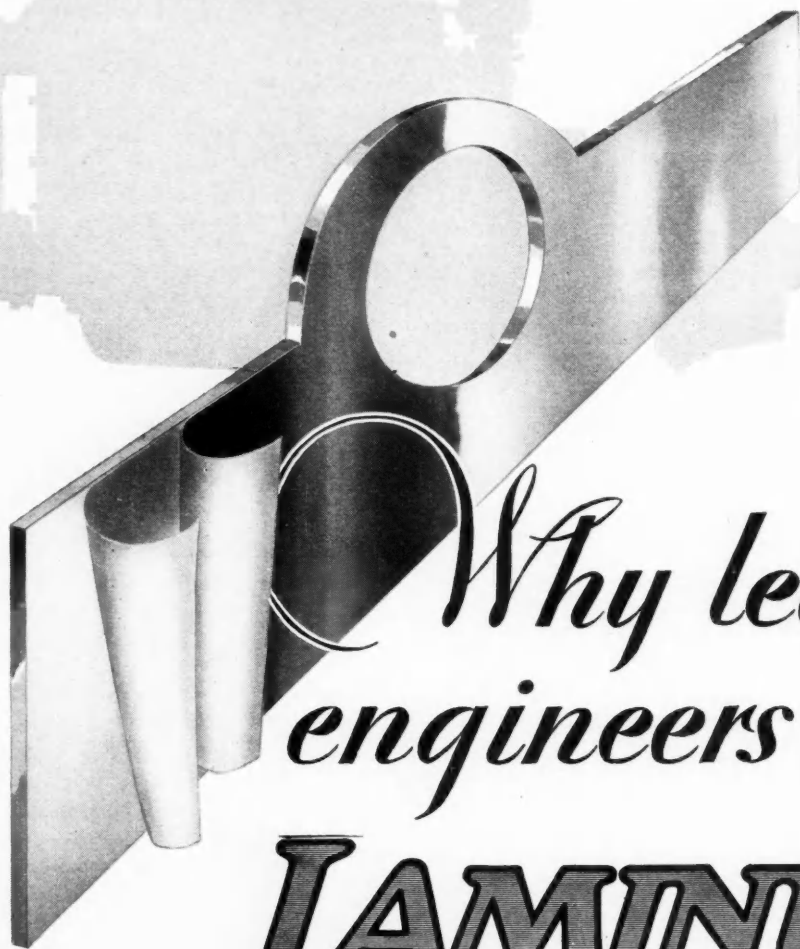
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# AUTOMOTIVE INDUSTRIES

VOLUME 62

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NUMBER 13

## First Quarter's Business Better Than Four-Year Average

*Automobile industry doesn't have to "recover" in order to register the second biggest year in its history, from the standpoint of dollar volume vehicle production.*

By LESLIE PEAT

**D**URING 1930 automobile and truck manufacturers in the United States and Canada will produce approximately \$4,100,000,000 worth of motor vehicles. The average annual production for the past four years, including the peak year of 1929, was \$4,181,598,250 per year. This year's retail-dollar-volume, based upon the *Automotive Industries'* estimate of a production of 4,750,000 cars and trucks, will be actually larger than that of any of the four previous years, except 1929, when the total retail volume reached \$4,621,974,000.

The automobile business doesn't have to "recover" in order to register the second biggest year in its history, from the standpoint of dollar volume of motor vehicle production—and the biggest year ever known from a service and maintenance standpoint.

All it has to do to reach these goals in 1930 is to go along for the rest of the year *relatively* as well as it has done during the first quarter.

While a lot of people have been asking when the automobile business was going to "come back," the industry has been turning out a first quarter sales record definitely ahead of the average of the first quarters of the last four years.

Automobile business for the first quarter of this year was better than the average of the first quarters of 1926, 1927, 1928 and 1929. New passenger car registrations

will show a gain of about 3 per cent over the average of first quarters of these past four years—and that includes the record-breaking years of 1926 and 1929.

First quarter gasoline consumption is expected to reach 84,000,000 bbl., more than 21,000,000 bbl. over the total used during the first quarter of last year, and about 35 per cent more than were used, on an average, during the first quarters of the past four years. It is estimated that this year's gasoline consumption will compare favorably with last year's total volume, and will be a marked gain over the average annual consumption for the past four years.

Gasoline consumption is a fair indication of the use of cars. This increase during the first quarter means that the volume of service and maintenance business is being increased again this year, adding millions of dollars to the incomes of garages and service stations throughout the country.

Not only have new passenger car sales compared favorably with the average of the first quarters of the past four years, but there is strong likelihood that new passenger car registrations during the second quarter of this year will show a still more favorable comparison with the average second quarters of the four previous years. It is quite conceivable that second quarter production will exceed 1,000,000, the

### Retail Sales Conditions

*First Quarter Retail Automobile Business, 1930, as Compared With Averages for the First Quarters 1926, 1927, 1928 and 1929*

Area	New Car Sales	Used Car Sales	Outlook
New York .....	Same	Same	Fair
Boston .....	.....	.....	.....
Buffalo .....	Loss 10%	Loss	Fair
Springfield .....	Loss	Same	Fair
Philadelphia .....	Same	Loss	Fair
Pittsburgh .....	Same	Same	Good
Durham, N. C. ....	Loss	Loss	Fair
Louisville .....	Loss	Gain	Fair
Columbus, O. ....	Same	Loss	Fair
Cincinnati .....	Gain	Gain	Good
Cleveland .....	Gain 8%	Gain 9%	Good
Detroit .....	Gain	Gain	Good
Chicago .....	Same	Same	Excellent
Milwaukee .....	Gain	Same	Good
St. Louis .....	*Gain 8%	*Same	*Fair
Kansas City .....	Loss	Loss	Excellent
Denver .....	Loss	Loss	Good
Dallas .....	Gain	Same	Good
Oakland .....	Same	Same	Good
San Francisco .....	Same	Same	Good
Seattle .....	Gain	Gain	Excellent

\* As compared with first quarter, 1929, only.



**Production by Years**

Year	Retail Value of Motor Vehicles Produced in U. S. and Canada	Motor Vehicles Produced
1926 .....	\$4,286,413,000	4,505,661
1927 .....	3,600,941,000	3,580,380
1928 .....	4,217,065,000	4,601,130
1929 .....	4,621,974,000	5,621,687
4-Year Average .....	4,181,598,250	4,577,206
1930 Estimate .....	4,100,000,000	4,750,000

1928 figure. New car registrations may even approach 1,138,000, the 1926 second quarter figure. The average second quarter new registrations of passenger cars for the past four years was 1,089,000 units.

Decreases in used car stocks during the first part of the first quarter, reported to *Automobile Trade Journal* and *Motor Age*, by hundreds of dealers, indicate that, in this respect, the trade is doing somewhat better than holding its own. Although used car stocks are still heavy, dealers are quite optimistic.

It has been the common agreement of business analysis that 1929 was unusually good. Many previous records were broken. Not only did the automotive field see high records smashed, but other industries broke records in volume of business. It would be unfair, therefore, to expect this year's business to exceed 1929. In this article, the average for the past four years has, therefore, been used to strike more normal comparisons.

Figures in the building industry prior to 1929 are not available in break-down form, so we were unable to trace construction in the automobile field beyond the beginning of last year. Thus far, however, 1930 compares favorably with 1929 in new construction as well as in additions to automobile and parts plants. Machine tool sales are spotty and somewhat under the average first quarter sales for the past four years.

Manufacturing activity generally has been showing a general recovery from the sharp slump which occurred during the latter part of last year. But it does not follow that this general recovery is the beginning of a new period of expansion. Observers seem to think that 1930 will more nearly parallel 1928 in production in all fields and that the next 12 months will see little, if any, actual expansion of manufacturing facilities.

Sufficient time has not elapsed to complete any readjustment that would be comparable to the tremendous boom which the country has experienced during the 24 months previous to last October's depression. The current business slump is world-wide. More than mere optimism will be needed to overcome the effect of the depression which we have recently experienced.

Generally speaking, the credit situation has shown a marked improvement since last fall. This was largely due to the curtailment of the demand for funds by Wall Street and business following the slump in the stock market and the general business recession. Yet the credit situation has not been entirely corrected and readjustment during the past month has made slower progress than during the period immediately following the stock market crash. Interest rates are generally down to the level which started the business expansion at the beginning of 1928. A further curtailment of loans consequently seems necessary before credit is in a position sufficiently strong to permit any broad expansion of loans without the immediate penalty of a renewed advance in interest rates.

Pessimistic prophecies to the contrary notwithstanding,

ing, instalment sales have actually registered a slight increase thus far this year, as compared with 1929. The range of instalment purchases has increased and has been extended into the plant equipment field. Apparently the Wall Street crash of last October and November has stimulated this method of purchases. Although severe loss was suffered by companies doing business through partial payment financing, the losses were neither unprecedented in number of accounts nor in volume of money.

The economic principle of instalment selling, a type of merchandising procedure so largely used by the automobile business, has not suffered the upsetting influences of the recent debacle. The credit companies doing business in the automotive field report high confidence for the next three quarters—and point with no little justifiable pride to the manner in which their business weathered a bad storm of public hysteria.

Loss ratios indicate that there is very little to discourage a wide use of credit companies' facilities this year, and prospective purchasers of cars and equipment will not find it hard to obtain adequate financing. Those who have observed the reactions to previous depressions, from this point of view, have been inclined to optimism in their outlook for 1930.

The number and dollar-volume of cars financed in November and December, 1929, as a matter of fact, was actually considerably in excess of the number and volume in dollars of cars financed during the same months of the previous year, according to C. C. Hanch, of the National Association of Finance Companies.

**Business Above Average**

A survey of the retail automobile business for the first quarter of 1930, first completed by *Automotive Industries* staff writers and correspondents in every major market center in the country, indicates that business is ahead of the average for the past four years, and in several cases actually is showing a gain over the peak year of 1929. The outlook is generally good for the second quarter of this year, dropping in some cases to fair, but only occasionally to poor.

The New York area, for instance, showed that retail passenger car sales were running about 50 per cent behind 1929, but the first quarter compared favorably with 1928 and showed a gain over 1925 and 1926. This, in spite of poor business conditions, proves the automobile industry to be taking a lead toward recovery.

Second quarter prospects compare favorably with the second quarters of years previous to 1929, but are not expected to reach the record-breaking totals marked up last year. Used car stocks have been reduced, and new car stocks are far from oppressive, dealers report.

**New Passenger Car Registrations**

First  
Quarter  
Average  
1926, 1927,  
1928, 1929



660,000 CARS

First  
Quarter  
1930  
Estimate



675,000 CARS



Buffalo, Springfield and northern New England dealers showed considerable recession over the 1929 first quarter sales, and a slight drop from the average first quarter sales for the past four years. The outlook for the second quarter is good, as the entire industrial prospects for this area are expected to improve, and third quarter prospects are still brighter.

Pennsylvania, New Jersey and lower New York showed considerable recovery during the last 15 days of the first quarter, and generally speaking, will show larger first quarter sales totals than these areas reported, on an average, during the past four years. The slump in automobile production last fall reacted severely against Pittsburgh and the Mahoning Valley steel districts, running into northeast Ohio, but the general pickup in manufacturing activity has given momentum to automobiles sales. A bright second quarter is predicted by dealers' spokesmen.

#### South May Show Losses

The Southern States have not shown much recovery over the last quarter of 1929, and, taken as a whole, this section of the United States will show a drop in sales, as compared with the average first quarters of 1926, 1927, 1928 and 1929. Baltimore, Durham and Louisville showed a loss for the first quarter, as compared with the average of the first quarters of the previous four years, but the outlook is brighter than dealers expected it to be a month ago.

North Carolina will show a large drop in new car registrations for the first quarter of 1930, but sales in the state show some recovery over the sales for November and December, 1929. Dealers throughout the state, according to their spokesmen, expect a gradual climb during the second and third quarters of this year, however, in spite of the generally unsatisfactory agricultural and business conditions of the state. Weather and farming conditions have improved greatly during the past two months.

Cleveland, Columbus, Cincinnati and Toledo all report first quarter business ahead of the average for the previous four years. Stocks generally are below those of last year, and considerable optimism is felt by dealers in the larger cities. Reports from the smaller communities show that local conditions are exerting a strong influence on new car sales. Several smaller cities report business off during the first quarter. Agricultural conditions are on the upturn throughout the state.

Detroit has shown an upturn in general business, which means that automobile business has improved. This trend toward more sales has been slow in Wayne County thus far this quarter. It is estimated that the first quarter retail sales will be larger than sales during the corresponding period of 1926, 1927 and 1928, although less than the 1929 first quarter period. Business men generally expect the second quarter to show con-



siderable improvement, although Michigan suffered a poor year agriculturally.

Chicago showed little gain over the average totals of the retail passenger car sales for first quarters of the past four years, but automobile distributors and retailers are confident that the second quarter will show considerable improvement. Used car sales, on the other hand, are ahead of the first quarter of 1929, and exceed the average for the past four quarters by a good margin.

Both the statistical and the psychological position of the passenger car market in Milwaukee and Wisconsin for the first quarter of 1930 is much more favorable than had been expected, and while no particularly high hopes are held out for the second quarter as a record-breaker, it is generally felt that it will hold its own, at least in comparison with similar periods in years before 1929. The first quarter even held its own with last year, judging by these comparative figures, which covered new car registrations of all makes for all of the State of Wisconsin:

	1930	1929	1928	1927
January	4,415	4,496	3,438	4,271
February	4,428	3,831	3,989	4,263
March	5,000*	5,349	5,544	8,164
<b>Total</b>	<b>13,843</b>	<b>13,676</b>	<b>12,971</b>	<b>16,698</b>

\* March estimate.

Following are more specific comparisons of Ford and Chevrolet new car registration figures:

	Ford			Chevrolet		
	1930	1929	1928	1930	1929	1928
January	1,558	1,651	44	1,097	531	1,095
February	1,697	1,126	72	1,175	889	1,474
March	1,700*	1,454	499	1,200	1,233	1,729
<b>Total</b>	<b>5,955</b>	<b>6,160</b>	<b>615</b>	<b>3,472</b>	<b>2,653</b>	<b>4,298</b>

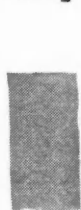
\* March estimate.

General business conditions in Wisconsin, and to some extent further west and to the south, are showing improvement. The general impression seems to be that the effects of the shock of last fall's depression are wearing off more rapidly than expected. Collections are poor, but not distressing in this area.

Seattle seems to be leading the Pacific Coast States in recovery from the slump which occurred during the last three months of 1929. New car sales and used car sales are actually ahead of the 1929 totals, and considerably in advance of the previous four-year first quarter average.

#### U S. Consumption of Gasoline

First  
Quarter  
Average  
1926, 1927,  
1928, 1929



62,332,500 bbl.

First  
Quarter  
1930  
Estimate



84,175,000 bbl.



*L. B. Manning, vice-president of the Cord Corp., in charge of aeronautical activities*

## Cord Corporation *Produces* of *Experience* Gained

**D**URING the past few years there has been a growing amount of discussion as to the relationship of the automobile and aircraft industries. Engineering problems have been compared, manufacturing principles have been pointed out as analogous for the two industries. Even the automobile

dealer as a merchandising outlet for the aircraft manufacturer has received serious consideration.

It may have been a coincidence that, at meetings held during the recent International Aircraft Exposition at St. Louis, this aspect of the aircraft situation was brought to a climax, while at the same time one of the outstanding topics of discussion at the show itself was the Stinson-Lycoming Junior cabin plane with its low price of \$5,775.

As everyone who follows aircraft development knows, the Stinson Aircraft Corp., and the Lycoming Manufacturing Co. are both controlled by the Cord Corp. of Chicago, a company whose officers were responsible for the present development of the Auburn Automobile Co. Its president is E. L. Cord, president also of Auburn. Its vice-president is L. B. Manning, who also is in direct charge now of the aeronautical activities of the Cord Corp.

It was on Mr. Manning we called, when we wanted to know what were the general ideas back of the expansion of the Cord Corp. into the aircraft field. There was interest in how planes could be built at so low a cost as to make a price of \$5,775 possible—a third less than that of the lowest priced comparable planes. The general feeling among aircraft manufacturers at St. Louis was that it "couldn't be done at a profit." What follows here is what Mr. Manning told us in answer to our questions.

First, it may be well to explain that the Cord Corp. is a holding and management company paying no salaries to its executives, and organized for the purpose of acquiring and developing companies in the motorized transportation field. It does not have an extensive set-up or capitalization, and therefore has a minimum of overhead. In its relationship with its subsidiaries and affiliated companies it is mainly a coordinating factor exerting an external or supplementary rather than an internal control on their various activities.

The Cord Corp.'s decision to enter the aircraft industry about two or three years ago was mainly based on a desire to expand the market possi-

*High factory profit on engines and  
of company's present manufacture  
Adequate first quarter profit*

By ATHEL F.

bilities for the Lycoming engine. The increase in overhead involved in such a move was relatively slight, due to the fact that the company already had a complete manufacturing organization employing over 3000 men in the annual manufacture and sale of over 65,000 engines for automobiles, trucks, tractors, motor boats, buses, etc. A considerable proportion of the manufacturing equipment and skilled mechanics were available in other divisions. The chief additional requirements were the purchase of aircraft engine dynamometer laboratory equipment and a designing nucleus. Val Kronstead, formerly of Curtiss Aeroplane & Motor Co., was secured to head the developmental engineering staff.

With the approach of completion of the experimental developmental period on the Lycoming aircraft engine, a final analysis of the market situation was made to determine the merchandising plan to be followed. The question boiled down to whether the Cord Corp. should sell the engines to plane builders, whether it should build its own planes, or whether it should do both.

The initial decision reached was based on the conviction that the money which would first be paid in any quantity by the public to the aircraft industry would be in the shape of fares for rides. It was evident therefore that economical transport equipment promised the best immediate market possibilities. The Cord Corp. felt that for maximum operating economy a transport plane should be of relatively small rather than exceptionally large size. A 10-passenger capacity was determined upon as the approximate desideratum.

Moreover, it was felt that the public demanded certain other features in its transport ships. First, that they should be tri-motored for insurance against forced landings from motor failure. Such a ship should be able to fly and climb with any one of the three motors out of commission. Other features demanded by the public, it was believed, were steel construction for the vital parts, dual control, closed cabins, and electric starters, as standard equipment.

Finding no equipment exactly meeting its requirements readily available, the Cord Corp. proceeded to develop its own transport plane, the Stinson "Airliner," which was announced this



# Low-Cost Planes by Means in Automotive Field

*ships found to be unnecessary in view  
ing and merchandising system.  
assured by orders in hand.*

## DENHAM

week, priced at \$23,900. In this ship, which is a 10-passenger tri-motored cabin monoplane, are found the characteristics set up as fundamentally requisite, including special bridge truss-type steel spars developed by this company.

As with all Stinson planes, safety has been made the primary factor sought and in this regard it is of extreme importance that the Stinson Airliner climbs well under full load with only two engines operating.

The ball-bearing controls are unusually easy to operate for this size plane, while the adjustable fin as well as stabilizer makes it possible to trim the ship for any condition and its ease of handling makes it comparable to any single-engined cabin ship. The fin adjustment easily takes care of one inoperative engine so that normal rudder action is unchanged. Rudder control is positive enough that with one nacelle engine inoperative, turns can be made with or against the remaining nacelle engine. Stability is such that the ship can be flown with ease using the rudder alone or the ailerons only.

While development of this plane was still in progress it was decided not to concentrate on a single line of planes, but to branch out into other airplane markets, to obtain maximum production possible, and thereby reduce both overhead and material costs. It was also felt that, to get a complete business of this type going, it was desirable to acquire an established manufacturing company with a good background. Following an investigation of costs of all airplane companies which were building comfortable and easily handled closed planes, the Stinson Airplane Co. was finally acquired last November for the basis of an exchange of stock.

The acquisition of the Stinson company made possible the meeting of the first three of the four major requirements set up by the Cord Corp. These were:

1. A complete line should be available.
2. Comfort and ease of handling should be comparable to that of automobiles in comparative price classes.
3. To insure reliability, no option in the major constituents of the airplane should be available.

4. The lowest prices at which quality merchandise could be sold.



The major immediate problem remaining was that involved in the question of cost. Its experience in merchandising automobiles in the higher price ranges clearly indicated to the Cord Corp. that if there was to be any great increase in the market possibilities for planes, lower prices were essential. This meant reducing the cost of materials and parts, manufacturing and distribution.

Analyzing these costs it was evident that since the Cord Corp. was not overcapitalized and did not depend solely for its income on the airplane field, that a high factory profit on both the engine and the plane was unnecessary. In this respect it may be well to bring out here that the contracted production of 300 ships by Stinson during the first part of 1930, will give the Cord Corp. a quite adequate profit on its aircraft operations.

In its investigation of not directly controllable costs, as in the purchase of parts from independent appliers, it was found, however, that a tremendous possibility existed for lowering the manufacturing costs of the final product. Due to the small quantities actually covered by individual orders, parts vendors had been forced to price aircraft supplies on a small quantity basis, irrespective of manufacturing cost. They had become accustomed to the idea of discounting by about 90 per cent the estimated requirements (not tentative orders) of their customers.

Its intimate knowledge of manufacturing costs, derived from automobile practice, stood the Cord Corp. in good stead. With the offer of actual orders for parts for 2500 engines for instance, it was even possible to reduce the bill of materials considerably after the "final bids" had been received. To do this, however, there devolved on the Cord Corp. the necessity of conducting a campaign of education among prospective suppliers as to the market possibilities. The placing of orders in such comparatively large quantities was the final method by which the skepticism of parts vendors was finally overcome to a sufficient extent to secure their cooperation. It is a peculiar commentary on the present state of the airplane parts industry that such a move was found necessary—that the customer had to convince the supplier that he could be sold airplane and engine supplies in real quantities.

Manufacturing costs on the plane and engine assembly are being reduced mainly by simplification and standardization and by tooling up many operations



E. L. Cord, president of  
the Cord Corp.



heretofore done by hand. The Cord Corp. feels that frequent model changes are undesirable and that it should be possible to build a ship which will be salable for a period of about three years without radical changes in design.

There remained the problem of merchandising set-up. Here it was possible to apply advantageously the lessons learned from the automobile field. In this respect the Cord Corp. believes that the success of any dealer organization depends upon the values in the merchandise it has to sell, and not on the amount of the discount.

All Stinson dealers operate under direct factory contact. In addition the Stinson company in order to provide better service to dealers and to the public, has established factory branches in five or six strategically located points. These branches will carry a complete line of ships, both for demonstration and delivery purposes. The branches will also be equipped with factory jigs, tools and other necessary equipment for repairs and overhaul of Lycoming engines.

By placing demonstrators of the larger types under indirect factory control, it is also possible to reduce the cost of demonstrating planes to people who are not prospective customers for the type of ship which they want to "try out." As to the factory-dealer relationships, the following additional points stand out:

1. The Cord Corp. feels that many of its best dealers will probably come from other industries. By merchandising the airplane, its sale is taken out of the hands of the airplane specialist—the former pilot, etc.—and made available to any retail organization, with the minimum of specialized sales training.

2. Its planes will not be sold through Auburn dealers. As a matter of fact, the Cord Corp. does not consider the average automobile dealer better suited to the handling of airplane sales than other types of retail outlets.

3. While a new distributing organization is therefore being built up for domestic sales, it is felt that the "general importer" characteristics of foreign sales outlets of the Auburn export organization make the latter readily adaptable to the handling of its airplanes abroad.

4. To enable the maintenance of low prices, special equipment and special paint will be sold only at extra cost and with delivery subject to the ability of the factory to handle such work without interfering with standard production runs. Such special sales will be expected to yield an additional profit to both factory and dealer.

5. Airplanes will not be shipped to dealers on consignment.

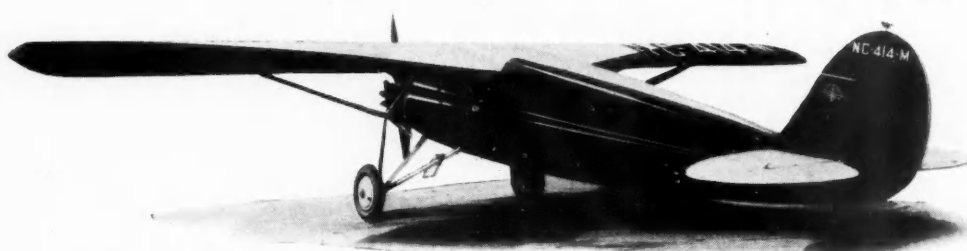
6. Dealers will not be allotted closed territories.

7. Financing arrangements will be available. Terms will depend largely on the individual case.

8. There are no price guarantees, experience in the past having shown, it is claimed, that such guarantees are unnecessary.

9. Dealers at centers of population will carry stocks of replacement parts to be sold at a reasonable cost.

It is the plan to have parts available within an overnight ride from even the most inaccessible location in the United States.



*The Stinson Junior cabin plane, which was introduced at the St. Louis Aircraft Show, priced at \$5,775*

10. Successful managers of factory branches will probably be enabled to purchase substantial interests in such branches, when their ability and financial responsibility has been demonstrated.

11. There will be no annual model changes, but betterments will be added continually.

12. Dealers have available a complete line of planes ranging from \$5,775 to \$23,900, each favorably priced on a competitive price basis.

13. Ships are to be sold only with the engine. No engine options are available.

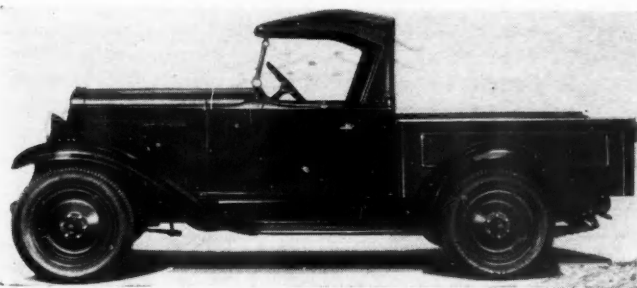
As to the future, the Cord Corp. feels that the real big market for planes is among the classes of business and individuals who are neither using them at present nor thinking of using them. The Cord Corp. realizes that the present low prices of its ships are probably not justified by the market possibilities demonstrated up to now, but that these prices and the concurrent merchandising set-up will result in an expanded market. Moreover, Mr. Manning said that he believed it was quite possible that within three years the Lycoming powered Stinson Junior, at present listing at \$5,775, would sell for from \$2,500 to \$3,000, this purchase price including a manufacturer's training course. This price will be made possible, he felt, by lowered manufacturing, materials and distribution costs largely as a result of increased production, resulting from increased demand brought about by manufacturers.

## Chevrolet Roadster Delivery

IN order to meet the requirements of its expanding commercial car business, the Chevrolet Motor Co. announces a roadster delivery model to supplement its present commercial car line.

Designed for every variety of pick-up work, the roadster delivery is powered by the six-cylinder valve-in-head Chevrolet engine. It allows for the use of a 66-in. loading space, without excessive overhang. It is 45 in. wide, 14 in. high and 24 cu. ft. in capacity.

The unit is listed at \$440 f.o.b. factory, Flint, Mich., with pick-up box extra.



*Chevrolet roadster delivery*

# Almost Every Automotive Material Discussed by A. S. T. M.

*Wide scope of program at technical sessions in Detroit last week limited meeting to reading of twelve papers, which covered subjects ranging from fuels and rubber to finished products.*

**C**ROWDING twelve technical papers into two sections of about two-and-one-half hours' duration each leaves practically no time for discussion. It was therefore unfortunate that the technical program of the Detroit regional meeting of the American Society for Testing Materials was confined to a single day (March 19). Plenty of material was presented on which lively discussion was almost sure to have developed had there been time. Nearly every kind of material used in automotive production was referred to in the papers presented, from fuels and lubricants to rubber and finished materials.

Aside from the limitation of discussion by lack of time the meeting was a success. Extending an invitation to the S. A. E. and A. S. T. M. was a happy idea, and the representation of these two organizations on the dinner meeting program augurs well for greater cooperation between technical societies in the future. C. F. Kettering was toastmaster at the dinner, while the "speaker of the evening" was "Audible Light," an assembly of photo-electric apparatus which will be remembered by members of the S. A. E. who attended the summer meeting at Saranac Inn last year, or the winter meeting of the Detroit Section. The presentation was under the direction of John Bellamy Taylor, of the General Electric Research Laboratories.

In view of the paucity of discussion at the technical sessions, perhaps the simplest way of reporting the doings of the meeting is to summarize the various papers, and this is done in the following:

The necessity of developing finishes for fenders which will make the life of such finishes equal to that of auto-

mobile body finishes was a point strongly emphasized by M. J. Callahan, chemical superintendent, Chemical Products Division, E. I. du Pont de Nemours & Co. "Contrary to all other parts of the automobile, the finish on fenders has remained static," Mr. Callahan stated.



M. J. Callahan, E. I. du Pont de Nemours Co., who spoke on automobiles finishes before the A.S.T.M. regional meeting in Detroit

Continuing, he said: "There have been advances in production methods resulting in shorter time schedules in finishing, but these changes have brought no improvement in the life of the finish under service conditions. Without question an improvement will result shortly. It is inconceivable that the finishes industry which has solved the other problems of automotive finishes, will fail to make an improvement in this field."

Mr. Callahan, while stating that at present there were no products in sight which had a reasonable chance of supplanting present-day lacquers, said that the present research in the field of synthetic colloids, carried on intensively by a number of prominent industrial concerns, may produce a product equivalent in properties to present nitro cellulose lacquers but based on new types of colloids. If an economic advantage can be obtained, Mr. Callahan felt, a substitution would undoubtedly occur.

The field of corrosion-resisting alloys also offers a possibility worthy of study. As Mr. Callahan put it: "It is not too radical perhaps to speculate that alloys may be produced which will allow of the manufacture of automobile bodies which will require no finishing other than a burnishing operation."

Among recent developments in the finishing industry, Mr. Callahan cited:

1. Adoption of mechanical methods of polishing, resulting in improved luster and at the same time reducing costs.

2. Reduction of chalking effect by careful selection of pigments, avoiding those particularly subject to chalking. In the discussion which followed the paper, Mr. McLeod of the Ford Motor Co. added to this that chalking effect had also been reduced by closer study of the relation of the pigment to different binders, and also the characteristics of the non-volatile vehicle.

Attempts made to adapt lacquers to "flow" application methods, Mr. Callahan said, had in-



Advances in die cast metals were discussed at the A.S.T.M. meeting by Charles Pack, consulting chemical engineer

licated that the process is uneconomical. For body finishing, moreover, the limitations imposed on body design by such a method render its adoption unlikely.

Undercoats of cellulose nitrate base, which have been used in finishing automobiles where floor space limitations called for an exceptionally quick drying undercoat, do not stand a good chance of supplanting the older type of undercoat, because their higher cost overbalances the advantage of more rapid drying, Mr. Callahan pointed out. Synthetic resin undercoatings (glyptols), developed during the past year, according to Mr. Callahan, first by the General Electric Company, are not as high in cost as the cellulose nitrate types, and also harden readily at lower temperatures, in contrast to the older types of undercoats, whose drying by an oxidation reaction is slow. They make possible the application of primer, putty and surfacer coats with only a short time interval for drying between operations.

**A.** L. Boegehold did not agree with the opening statement in Clair Upthegrove's paper on "Automobile Bearing Metals." Mr. Upthegrove, who is attached to the



A. L. Boegehold, General  
Motors Research Laboratories

Chemical Engineering Dept. of the University of Michigan, said that it was generally accepted that a single-constituent metal is not well suited for bearing purposes, the first requirement being that it have at least one hard and one soft constituent.

Mr. Boegehold, in differing with this assumption, said that recent tests made with a pure tin on a steel backing gave good results under rather severe conditions.

Mr. Upthegrove's paper represented to a considerable extent a summary of recent reports and papers on bearing metals. He believes that the need for the great multiplicity of bearing metals used at present is questionable. The reduction in number of such materials is largely dependent on the availability of testing equipment which will give really representative results as to bearing qualities, and Mr. Upthegrove urged concerted effort in this direction.

Of special interest were Mr. Upthegrove's comments regarding worm-gear bronzes as bearing metals. Aluminum bronze, he stated, had not been successful in this respect, although capable of standing up under greater loads than ordinary bronze, and he attributed this effect to insufficient difference between its hard and soft components. Tin, he found, could not be used in proportions resulting in the maximum strength of the bronze, due to brittleness involved. Phosphorus should be added only as a deoxidizer, depending on tin for hardening. Lead and zinc additions he finds undesirable or, at the least, unnecessary. The addition of nickel to tin bronze gives good results according to the author, although he

also quoted reports to the effect that the addition of nickel increased the friction. This he attributed to the characteristic of nickel bronzes of not being wetted as readily by oils, resulting in higher starting friction when fluid film lubrication is not present.

Production methods for bronze worm wheels were classified by Mr. Upthegrove in the following order: Best, centrifugally-cast; next, chill-cast, and last, sand cast. This is in the order of physical properties obtained. On the other hand, some recent reports quoted by the author had it that sand-cast bronzes wear better than chill-cast bronzes.

Aluminum alloy bearing metals are suggested by Mr. Upthegrove for use in connection with nitrided parts.

**A**N excellent recapitulation and analysis of recent papers and experimentation on the testing of motor fuels was given in a paper entitled "The Significance of Tests for Motor Fuels," presented by R. E. Wilson, head of the development and patent department, of the Standard Oil Company of Indiana.

Among the points again brought out by Mr. Wilson were the following:

1. Automobile manufacturers must design their fuel systems so that temperatures will not exceed 140 deg. in the system. Otherwise vapor lock cannot be prevented with a fuel that is adapted to easy starting (with a low 10 per cent point).

2. In addition to the 10 per cent point on the A. S. T. M. distillation curve, the 90 per cent point is important for control of crankcase dilution, while the 50 per cent point is valuable for the determination of distribution characteristics.

3. No satisfactory method has been developed for rating fuels for anti-knock value. "Standard test engines," have not been satisfactory, owing to the effect of minor vibrations in operating conditions, such as carbon formation, spark plug conditions, etc.

4. Troubles from gum formation have been shown to be unrelated to actual gum content of the gasoline, due to the variable evaporation rate found in actual service. Work is now being carried on for the establishment of test methods on this subject.

5. Crankcase corrosion is independent of the type of sulphur content of a fuel, being related directly to the burned sulphur, which as sulphur dioxide in the presence of condensed water in the crankcase forms the corrosion-producing acids.

**H**IGH-PRESSURE, low-temperature die casting of brass is now being done on a commercial scale in several European countries, and holds out considerable promise for future automotive development in this country, Charles Pack, consulting chemical



R. E. Wilson, development  
and patents department,  
Standard Oil Co. of  
Indiana



engineer, stated in his paper on "Advances in Die Cast Metals for Automotive Use."

Owing to the rapid volatilization of the zinc content when the brass is heated above its melting point, and also the reduced life of the product with increasing die-casting temperatures, such materials should be cast at or below their melting point, requiring exceptionally high pressures. Bronzes are subject to the same condition, but low-temperature die-casting of the latter materials would in addition involve the development of new die materials.

With respect to other alloys used for die-casting, Mr. Pack records his findings as follows:

1. Zinc-base alloys. Rapidly increasing in quantity, and represent 70 per cent of automotive die-cast consumption (over \$14,000,000 in 1929). Following are the useful composition ranges of automotive zinc alloys, as given by Mr. Pack:

Copper .....	3.00 to 6.00 per cent
Aluminum .....	0.00 to 5.00 " "
Magnesium .....	0.05 to 0.50 " "
Nickel .....	0.00 to 0.50 " "
Zinc .....	Remainder

Permissible Impurities

Iron, maximum .....	0.10 per cent
Lead, maximum .....	0.05 " "
Cadmium, maximum .....	0.05 " "
Tin .....	None

2. Aluminum alloy die-castings depend for their increasing automotive use largely on the development of a production process insuring uniform freedom from blowholes to enable their heat-treatment without blistering. Brake shoes represent one of the newer uses.

3. Magnesium alloy die-castings have not appeared commercially in this country, probably on account of the high cost of the basic raw material.

According to Mr. Pack, the automotive industry, in spite of the development of radio, automatic refrigeration, suction sweepers, etc., still consumes over 50 per cent of the die-castings produced, repre-



L. V. Redman, vice-president, Bakelite Corp.

sending a bill of approximately \$20,000,000 to the automotive industry in 1929.

**T**HAT KA-2 (chromium-nickel-iron alloy) steel, which recently has been introduced on automobiles, would eventually supplant all bright plated parts was forecast by C. M. Johnson, chief chemist, Park Plant, Crucible

Steel Co., in his paper on corrosion and heat-resisting steels as applied to automobile and bus use. This steel is manufactured under various trade names and with slight variations in composition, according to Mr. Johnson, by Central, Ludlum, Allegheny and Krupp-Nirosta, the latter the holding company.

This steel, containing 17 per cent chromium, 2-3 per cent silicon and 25 per cent nickel, has been found, according to Mr. Johnson, to increase the life of carburizing boxes to about 10,000 hrs., while with pusher or counterflow furnaces, a life of 20,000 hrs. may be expected.

Regarding corrosion of iron alloys, Mr. Johnson stated that his investigations had shown that ferrous sulphate is not active in corrosion, even in the presence of sulphuric acid and heat, unless it



W. H. Graves, chief metallurgist, Packard Motor Car Co.

Walter C. Keys (left), chief engineer, automotive development department, U. S. Rubber Co.

takes up oxygen from the air, when it becomes a great accelerator of corrosion of iron, copper, nickel and aluminum. The presence of chrom-

ium to about 12 per cent, however, practically inhibits the attack of ferrous sulphate. Soot should be carefully removed to prevent rusting, as it contains ferric sulphate.

According to Mr. Johnson, the scheme of using rust-resisting steel with spring or other plain, lower cost steel inserts offers possibilities where heavier sections, such as bumpers, are desired.

**A**S soon as it is realized how important it is to know that weight of air is going into the cupola, there will be a demand for apparatus which will accurately measure and control the cupola blast on the basis of weight rather than volume." This prediction was incorporated in a paper entitled "Present-Day Method in Production and Utilization of Automotive Cast Iron," which was presented by A. L. Boegehold, General Motors Research Laboratories. Changes of weight, with temperature and pressure changes from day to day, cause variations in manganese and silicon oxidation loss and

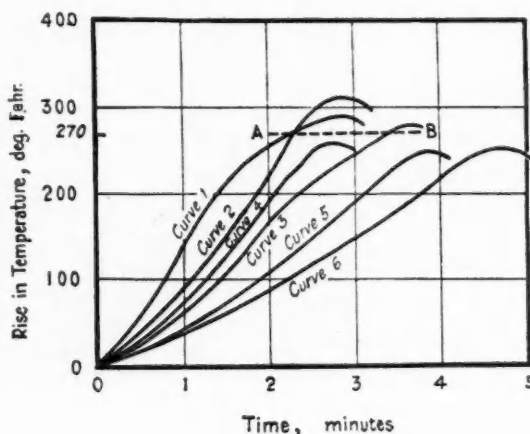
hence changes in the properties of the iron. Moisture in the blast should also be removed where thin sections are being produced, since it seems to cause increased hardness and formation of white iron in such thin sections.

Briquetting of machine borings and their use in place of pig iron was recommended by Mr. Boegehold as resulting in a saving of \$8.50 to \$9.00 a ton, based on a briquetting cost of \$1.30 per ton of borings. The borings cannot be used loose, of course, as they would be oxidized in passing through the combustion zone, or would be blown up the stack.



Prof. H. F. Moore, University of Illinois

**W**HAT constitutes "structural damage" to the material in a machine part? H. F. Moore, research



The curve at the left for burning time against rise in temperature for foundry cokes illustrates the basis of coke purchases by General Motors. Such cokes must cross line AB

A test recommended by Prof. Moore as worthy of investigation for short time determination of endurance limits is the Ikeda test (below)

professor of engineering materials, University of Illinois, answered the question under three general heads in his paper entitled "Recent Progress in Tests for Automotive Materials."

1. Elastic Failure. The main problem here is the question of standardization of methods and nomenclature for elastic strength tests.

2. Flow or "Creep." Recent study of materials at high temperatures has shown that under steady loads, they act like a viscous liquid to some extent, stretching, bending or twisting continuously, according to the load. Just what the "creep" limit is is not known, but arbitrary limits, within which "creep" does no appreciable damage, should be established.

3. Fracture. This subject is treated as mainly affecting repeated stress variations and impact loads, as elastic or creep failures would be limited by their respective specifications so that the fracture point should not be reached. The endurance limit seems to be the best way of determining resistance to repeated stress. Two recent test methods seem to hold promise of enabling the determination of the endurance limit in a reasonable time. One of these consists in measuring the power input required by a fatigue testing machine under various loads. It shows a marked increase of power input at a load which causes a stress not very far from the endurance limit as determined by long-time tests.

Another short-time test is the electrical resistance test of Ikeda. In this test the resistance of the fatigue specimen is measured while it is being subjected to cycles of stress of various magnitudes (see chart).

A distinct change of resistance is noted at a stress

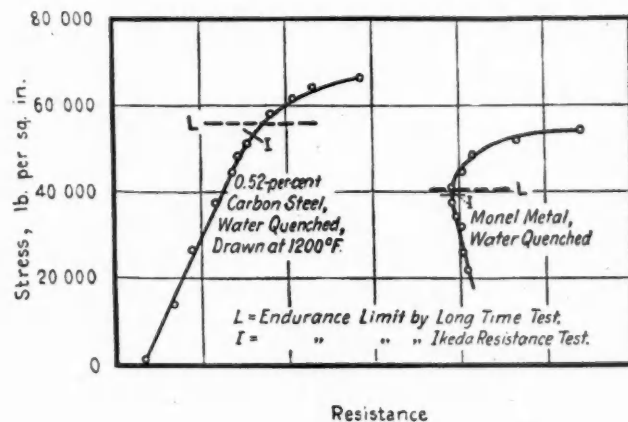
checking closely with the long-time endurance test.

With respect to impact testing, Professor Moore stated that the notched bar test seemed to have more to do with the notch in the metal than with the ability of the metal to resist shock.

Professor Moore also stated that experiments have shown that under repeated stresses below the endurance limit the original endurance limit is raised, especially in the case of cast-iron. This seems to be due to the ability of the metal to slip without starting a spreading crack, the localized elastic failure not being widespread enough to damage the piece as a whole to an appreciable degree.

Regarding ductility, Professor Moore emphasized the fact that this characteristic has little to do with the strength of a metal under either static or repeated load, serving mainly as an insurance against fracture in case of an occasional overload.

The change of properties of sound waves passing



through material in the early stages of damage and the use of the X-ray either to detect flaws or to study the atomic arrangement were suggested by Professor Moore as worthy of serious investigation.

**S**OME 65 distinct uses for rubber compounds in automobile construction were listed in the paper entitled "Advances in Rubber for the Automotive Industry," presented by Walter C. Keys, chief engineer, Automotive Development Dept., U. S. Rubber Co. Among the newer developments, Mr. Keys cited a carpet by Lea Fabrics, Inc., having a thin sheet of rubber vulcanized to the pile fibers. Mr. Keys stated that a design of shock absorber had been also recently projected in which resistance was obtained by three rollers equally spaced from a central shaft and arranged to indent and roll

against a surrounding stationary cam made of rubber.

In the discussion which followed this paper, A. W. Carpenter pointed out that elongation-stress charts, based on the stress per sq. in. of original cross-section, had little meaning in connection with rubber, owing to the large reduction in area with the application of stress.

ACCORDING to W. H. Graves, chief metallurgist, Packard Motor Company, the Rockwell hardness test and the Erichsen test are sufficient to determine the suitability of sheet steel with respect to its drawing qualities. In his paper on Sheet Steels for Automobiles, Mr. Graves suggested the following values for the specification of No. 18 or 19 gage steel:

Extra Deep Drawing	Deep Drawing
Analysis ..... S. A. E. 1010 ...	S. A. E. 1010
Erichsen value .... 11.0 minimum ...	10.5 min.
Rockwell hardness B-43 to B-53 ....	B-43 to B-53

Spring back, according to Mr. Graves, has been found directly related to hardness, and the specification of B-50 maximum for the Rockwell test will prevent excessive spring back on Packard parts.

VISCOSITY, stability and—under certain conditions—oiliness are the principal significant properties of automotive lubricants in the order of their importance, according to a paper entitled "The Significant Properties of Automotive Lubricants," presented by H. C. Mougey, assistant technical director and chief chemist, General Motors Research Laboratories.

"Under stability we would include the viscosity-temperature slope and the effect of too high a pour test, when an oil changes from a liquid to a plastic mass that the lubrication system may not be able to handle," Mr. Mougey explained. Continuing, he said: "Under stability we would also include any chemical changes by

which the oil might cause corrosion, gumming or excessive carbon. In addition the oil should not be volatile enough to affect the oil consumption of the engine greatly.

"The question of oiliness is still undecided. Under certain conditions oiliness may be of great value, but more data on the relation of oiliness to performance in service is required."

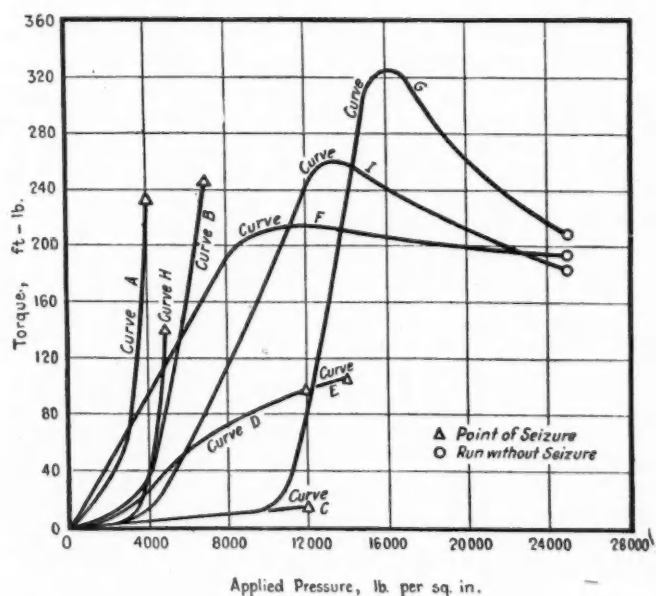
Aside from these qualities, and tests to determine them, Mr. Mougey indicated that other determinations were really meaningless as a definite determination of

what should constitute "quality" in an oil. As he put it: "This mysterious thing called quality is not a definite property of an oil but simply the result of using oils suitable to the uses to be made of them. The different tests developed by the A. S. T. M. are not definite measures of quality, and a property that may be desirable for one application may be very undesirable in others."

Noise, excessive oil consumption, and perhaps other troubles, are the determining factors which establish the minimum viscosity that can be used rather than the actual load carrying ability of the bearings, according to Mr. Mougey, who said further that this permissible minimum viscosity of oil for use in automobile engines is still undetermined. Oiliness is a quality that becomes important when fluid film lubrication fails. The accompanying chart, showing the result of tests carried out on several types of lubricants at the G. M. Laboratories, a steel shaft running in a hardened steel bushing, seems to indicate that there is a distinct relationship between this quality and the sulphur content of the oil.



H. C. Mougey, chief chemist, General Motors Research Laboratories



Relation of Torque to Applied Pressure.

A. Mineral Oil	Viscosity, 48 sec. at 210°F.
B. Mineral Oil	Viscosity, 90 sec. at 210°F.
C. Mineral Oil	Viscosity, 200 sec. at 210°F.
D. Lard Oil	Viscosity, 60 sec. at 210°F.
E. Castor Oil	Viscosity, 99 sec. at 210°F.
F. Mineral Oil Containing Sulfur	Viscosity, 40 sec. at 210°F.
G. Mineral Oil Containing Sulfur	Viscosity, 300 sec. at 210°F.
H. Commercial Fluid Grease Containing Mineral Oil and Soap	Viscosity, 500 sec. at 210°F.
I. Commercial Fluid Grease Containing Mineral Oil Soap and Sulfur	Viscosity, 2500* sec. at 100°F.
	Viscosity, 1500* sec. at 100°F.

\* Viscosity Taken Under 20 lb. per sq. in. Pressure.

The above curves, included in Mr. Mougey's paper, dealt with the determination of oiliness in lubricants

IN addition to a history of the development of phenol resinoids, L. V. Redman, vice-president, Bakelite Corp., also presented a general picture of the status of that industry in relation to the automotive. Among the recent applications of phenol resinoid the following were given:

1. A molding material of high electrical resistivity and dielectric strength, whose chief characteristic is its greatly lowered tendency to carbonize under the electric arc. At present it is used for distributor heads on Scintilla magnetos.

2. A similar molding material having increased flexibility to take care of differences in expansion rates between it and a reinforcing metal core, making the material available for use on steering wheels, etc.

3. An improved laminated material adaptable for thrust washers in the rear axles of heavy-duty trucks.

4. A molding material containing asbestos, with a high resistance to impact. A use is in universal joint covers.



# Diesel Engine's Brightest Future in Aircraft Development

*Competition on an economic basis with the gasoline powerplant limits possibilities in the passenger car field. Perfection of design merely a matter of time.*

WHEREVER automotive engineers assemble in these days to discuss improvements of powerplants, and reduction of their operating cost, one thing is sure to happen—someone will point out that the Diesel engine is the only possible and ultimate solution. And, as a rule, discussion will center on some technical details of relatively little importance. Very seldom, however, the automotive Diesel engine is discussed as an economic problem, and to the writer it appears that this side of the picture is at least as important as all technical problems can be.

Theoretically, Diesel engines of suitable power and speed can be built to replace the conventional gasoline engines in almost any self-propelling vehicle or other machinery using this source of power. For obvious reasons most Diesel engines, when first put on the market, will not be as reliable as a modern gasoline engine. But it has been proved that there are no problems connected with it that cannot be solved, so it can be said with confidence that the perfection of the automotive Diesel engine is merely a question of time and experience; just the same as it was with the gasoline engine in its earlier days.

To judge by the progress made with the high-speed Diesel during the last few years, it seems that in the near future there will be such engines on the market ready to prove that in regard to reliability and simplicity of operation, they can compare favorably with any up-to-date gasoline engine. And, besides, they will have such well-known advantages over the carburetor engine as steadier torque characteristics, reduction of fuel expense, etc.

However, in spite of the many claims made for ultimate supremacy of the automotive Diesel over the gasoline engine, there are no hopes that this complete victory will ever become a fact. It would not even be desirable for the Diesel engine industry.

Let us assume only that the Diesel engine would conquer some of the gasoline engine's principal markets such as that of the passenger automobile. The law of demand and supply would reduce the price of the gasoline and raise the price of the fuel oil probably to such an extent as to cancel most of the savings in fuel expense made with the Diesel automobile. At the same

time, however, this change of the fuel prices would seriously affect most of the other markets of the Diesel engine in which it is now safely established or even dominating. The objection may be raised that fuel cracking processes can be altered to meet these changed conditions, or that recent inventions make the conversion of coal into fuel oil a commercial possibility. It is admitted that these factors will have a tendency toward a less abrupt change in fuel prices, but it is very doubtful whether they would be powerful enough to keep the prices of fuel oil and gasoline anywhere near their present levels.

But even if the basic prices of gasoline and fuel oil would remain unchanged, the following example will demonstrate why the Diesel engine has little chance ever to replace the gasoline engine in the automobile. A medium-sized car, being driven about 15,000 miles per year, and having a gasoline consumption of one gallon per 16 miles, at a cost of 19 cents, would require a yearly fuel expense of about \$178.

Assuming that a Diesel automobile of similar characteristics would average 25 miles per gallon of fuel oil costing 7 cents, its fuel expense would be about \$42. With a yearly reduction of the fuel bill amounting to \$136, and an average life of such an automobile of six years, \$816 represents the total possible saving in fuel. This calculation, however, must be considered highly optimistic in view of the possibilities of state taxes and increased handling charges on fuel oil in case it should be used and distributed in a way similar to that of gasoline. Furthermore, the average automobile buyer will never accept a Diesel engine in his automobile unless the increase of cost of this engine over the gasoline engine is considerably less than the amount

represented by the possible saving in the fuel bill. All these conditions set a price limit for an automobile Diesel capable of competing economically with a modern gasoline engine that is considerably lower than its manufacturing cost would probably be.

Applying the same calculations to a motor bus, however, gives an entirely different picture. The following figures are assumed for a long-distance passenger bus: daily mileage, 200; yearly service, 250 days; gasoline consumption, 1 gal. per 4 miles, at a tank-wagon price

## Victory Far Off

IN spite of the many claims made for the ultimate supremacy of the automotive Diesel over the gasoline engine, there are no hopes that this complete victory will ever become a fact, Max Hofmann, Diesel Engineer, says in the accompanying article, which was read before the Milwaukee section of the S. A. E. early this month.

# Market Lies

By MAX HOFMANN

Diesel Engineer, Waukesha Motor Co.

plus state tax of 12 cents per gallon. Here, the fuel bill would run as high as \$1,500 a year. A comparable Diesel engine would have a fuel oil consumption of 1 gal. per 6 miles at a price of about 5 cents. Thus, the Diesel bus fuel bill would amount to \$417, and show a yearly saving in fuel of \$1,083. With an average life of four years, a Diesel bus would save \$4,332 in fuel. Even with a small production, it should be possible to build a Diesel engine for this purpose with an increase of about \$1,000 over the price of a high-grade gasoline bus engine of about the same performance. In this case the adoption of the automotive Diesel looks like a paying proposition.

There is one advantage of the Diesel engine for automotive vehicles that so far has been given very little attention. When determining the size of the engine for any vehicle, certain requirements for acceleration and hill-climbing speed must be met. This requirement of a certain power at a reduced engine speed, rather than the peak horsepower of the engine, determines the minimum size of the engine. And here the Diesel engine, with its high torque at lower speeds, outranks the gasoline engine. In other words, it should be possible to replace, for instance, a 100-hp. gasoline engine in a truck or bus by a suitable Diesel engine of 80 or 85 hp. without sacrificing any acceleration, hill-climbing power, or maximum speed on level roads.

Another of the advantages of the Diesel engine worth pointing out in connection with motor vehicles is that the lower heat losses through the cooling water will enable the use of a radiator about 20 per cent smaller than with a gasoline engine of equal power.

The two examples given above lead to one conclusion: The market of the automotive Diesel engine as a competitor of the gasoline engine is limited by its first cost, or, to define it more clearly, by the ratio between its advantages and its cost. Very little possibility is left to increase the advantages of the Diesel engine by improving the fuel economy or raising the b.m.e.p. to any important degree without simultaneously increasing the cost. The only way that the market can be enlarged is by the reduction of manufacturing cost of such engines. Drawing a comparison with manufacturing methods for gasoline engines, it appears that much can be done yet to reduce the cost of automotive Diesels.

Too much emphasis cannot be laid upon the necessity for specialization in the manufacture of Diesel engine parts like fuel pumps and injectors as a cost-reducing factor. Just as the gasoline engine manufacturer of today buys carburetors and magnetos from outside sources, the manufacturer of automotive Diesels must be able to purchase fuel pumps and injectors from firms that specialize in this line and are able to provide these parts at a fraction of their present cost. However, it will be necessary that these parts manufacturers design their product in such a way as to make it usable for the different types of combustion chambers, injection and fuel-governing systems as will survive in a really

## An Economic Comparison

A MEDIUM-SIZED car, being driven about 15,000 miles per year, would show the following comparisons with the use of Diesel or gasoline engines:

Gasoline Engine	Diesel Engine
<i>Fuel Consumption</i>	
16 mi. per gal.	25 mi. per gal.
<i>Fuel Cost</i>	
\$0.19 per gal. \$178 yearly	\$0.07 per gal. \$42.00 yearly

Applying the same calculations to a motor bus gives a different picture, as with the passenger car as the passenger car buyer, in Mr. Hofmann's opinion, will never accept a Diesel engine unless the increase in cost of the Diesel is considerably less than the amount represented by the fuel saving. The bus is assumed to be in long-distance passenger service, with 200 daily mileage, and yearly service of 250 days:

Gasoline Engine	Diesel Engine
<i>Fuel Consumption</i>	
4 mi. per gal.	6 mi. per gal.
<i>Fuel Cost</i>	
\$0.12 per gal. \$1,500 yearly	\$0.05 per gal. \$417.00 yearly

In the case of the motor bus, the saving of \$1,000 a year makes the adoption of the automotive Diesel look like a paying proposition.

competitive market. There will be little use for a standard pump or injector that requires a particular Diesel engine design suited to fit its characteristics.

He who has even taken the pains to wade through the large number of patents covering fuel-injection systems and Diesel combustion chambers must admit that a large majority of them do not have any reason for existence from an economic standpoint. Because most of them represent merely a different—not a simpler—way toward a certain goal, sometimes even a more complicated one than those known to the art already. The competition that is sure to come in the automotive Diesel field will weed out all those designs that have no other merit than just being different.

In the foregoing, no mention was made of one future field for the high-speed, low-weight Diesel that offers the brightest opportunities—the airplane and airship. Here, the ratio—advantages over the gasoline engine versus increase of cost—is shifted very much in favor of the Diesel. Of the advantages mentioned before, the higher torque at low speed of the Diesel loses its importance. But there are three new advantages of the Diesel aircraft engine over its gasoline competitor, namely: (1) reduction of fire hazard; (2) reduction of the combined weight of engine and fuel beyond a certain travel distance; (3) the elimination of radio interference caused by the ignition system of the gasoline engine.

Figures published concerning the Packard and the Junkers aircraft Diesels show that these engines use about 20 per cent less weight of fuel for a given length of journey, while the saving in fuel cost amounts to about 75 per cent, compared with a gasoline engine. There is little doubt that all these advantages will ultimately bring the airplane Diesel to dominate the entire field of aircraft engines except that of smaller engines.

It is hard to say how much time will elapse before the automotive Diesel takes possession of those markets where its many advantages counterbalance the

(Continued on page 516)

# Peerless Centralizes

*Factory at Cleveland has been re now follow the latest developments, both material and product hand*

By JOSEPH

*The end of the main assembly line, showing the new small Peerless Eight ready to drive out under its own power for the final inspection*

UNDER the stimulus of a new management the manufacturing facilities of the Peerless Motor Car Co., Cleveland, Ohio, have been centralized and concentrated within the practically integral structure now known as Plant 1. Behind this development is a background of careful planning, postulated on the latest developments and thought in production planning and management. With the exception of some of the outside walls, the plant has been completely rebuilt; partitions have been taken out, new floors laid and new skylights installed in order to afford good lighting. The new plant is completely conveyORIZED so that practically every manual operation in handling has been eliminated, and operations along the assembly line have been facilitated through the use of monorail conveyors, electric hoists, and hand hoists.

Artificial illumination has been well planned, with the result that the assembly lines and work benches are excellently lighted. Electrical wiring, air lines and power sockets are carried in concealed conduits, giving the entire plant an unusually clean appearance and incidentally eliminating a sizable maintenance problem. The main assembly line conveyor is of the floor level type of advanced design, having practically no exposed parts and possessing a desirable degree of safety. The return chain, as well as the reducing and driving mechanism, are located in pits under the floor level.

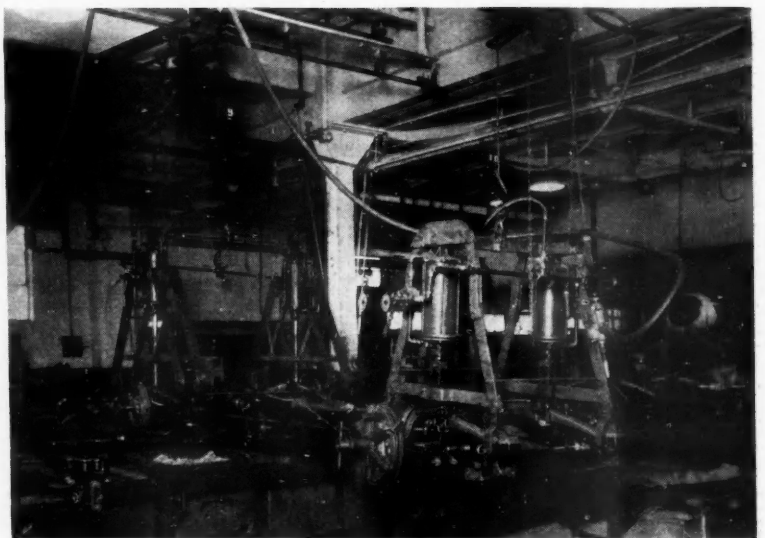
Interior walls and ceilings are tastefully painted, thus enhancing the effect of the skylighting and intensifying the impression of light and cleanliness. Needless to say, these are vital elements in a modern plant layout and the beneficial effects on the workers is reflected in tangible returns in the form of better quality, increased production and decreased labor turnover. Evidently none of these advantages have been overlooked, and as a matter of fact they have been capitalized at every turn.

The keynote of the new plant layout is sufficient utilization of floor space achieved by a compact grouping of progressive assembly operation. This fine balance between the maximum production rate and the minimum essen-

tial floor space has enabled them to eliminate unnecessary floor space, cut out many of the scattered buildings, and weld the plant into a compact unit with a minimum of overhead burden.

Assembly operations start with the frame. An interesting feature of this department is a newly designed, horizontal bed, hydraulic press, which is used to press the tubes into the spring hangers. The frame assembly is put together on jigs and completely riveted. It is then washed in a chemical dip tank, hot rinsed, dried and then conveyed over to the spray booth where it is sprayed with a quick-drying, synthetic base lacquer. The frame is now picked up on an overhead monorail conveyor and carried over to the first station of the chassis assembly line.

The chassis assembly line conveyor carries the frames sidewise and up-side-down at a convenient working height through 15 stations to the final assembly line which is at right angles to it. The terminal of the chassis assembly line is the chassis turnover, the operation of which is synchronized with the movement of the two conveyors. At the proper time, just when the assembly line conveyor space at the rear end is clear, the chassis turnover picks up a completed chassis assembly and sets it on the main line assembly conveyor track. Another feature of the chassis assembly line is the ingenious spring depressor fixture for the front and rear springs. This arrangement has been found to be a valu-



*Spring depressor fixtures are used at Peerless for the assembly of front and rear springs in the rubber shock insulators*



# Its Plant Facilities

*built entirely. Production methods with complete mechanization of ling a feature of the new system.*

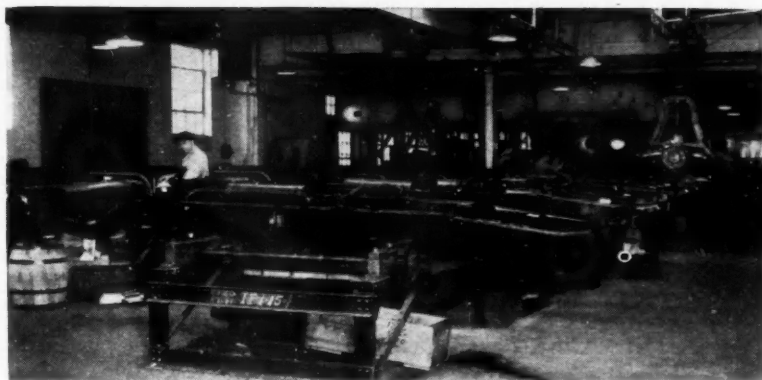
GESCHELIN

able and essential adjunct on an assembly job involving the use of rubber spring insulators. This fixture quickly and automatically deflects the spring to the predetermined amount and thus facilitates the assembly operation.

Just before the wheels are attached, the now practically completed chassis assembly passes through a spray booth, bridging the assembly line conveyor. Here the complete unit is sprayed with an air-drying, synthetic base lacquer, which quickly produces a durable, lustrous finish. As the frame emerges from the spray booth, it passes the wheel chute at which station the wheels are attached and the completed assembly then enters the chassis turnover fixture.

The main assembly line conveyor traverses the central parts of Plant 1 is set up in 19 stations from the chassis turnover to the final driveway at the head end. The main assembly line, as will be noted from the accompanying illustration, is well lighted, both by natural light and by the well-designed, artificial illumination from two banks of lamps arranged overhead. At the proper

*At the end of the line, the completed Peerless chassis is automatically engaged, turned over to correct position and set on the main assembly conveyor*



*The chassis assembly line at the Peerless Motor Car Co. plant. Note the frame resting with its under side up on the conveyor*

*Body lowering arrangement at the Peerless plant. Note the insulated blocks in the wheel housing and the method of gripping at the cowl*



point along the assembly line, the powerplant is fed in on an overhead monorail hoist. Further down along the line is the body drop from the second floor. Particular interest centers about the body lowering fixture. As will be noted from the illustration, the body hoist has two hooks engaging the cowl and two formed blocks fitting in the wheel housing. This fixture requires some manipulation in engaging and disengaging, but they feel that this time is well spent in view of the safety it provides, both to the operator and to the body finish.

Just forward of the body drop is a working pit 36 ft. long, built under the conveyor line. In conformity with the general scheme this pit is clean, airy, well-painted and well-lighted. Under these ideal working conditions, all of the under-chassis work, such as body fastenings, greasing and final inspection are accomplished with facility.

Another unusual operation that fits in with the assembly scheme is a large universal fixture on each side of the assembly line, on which the entire fender and running board assembly is built up as a unit. The fixture is well-designed and produces finished units that can be fitted to the frame quite readily. This is just another example of the way in which they have dovetailed an unusual operation to suit the particular requirements.

Final engine assembly operations are completed on a short assembly line, parallel to and a short distance away from, the main assembly line. The finished engines are then carried to the test blocks where each engine is run in on a dynamometer after coming off a routine block test before it reaches the assembly line. After the completion of the block test the engines are carried on the overhead monorail hoist to the storage space alongside the assembly line.

*(Continued on page 520)*

# Jaguar Major Aircraft Engine is Of With *Increased* Power

*Armstrong-Siddeley adds larger 14-cylinder powerplant to line as a development of original unit. One model has centrifugal supercharger for altitude use.*

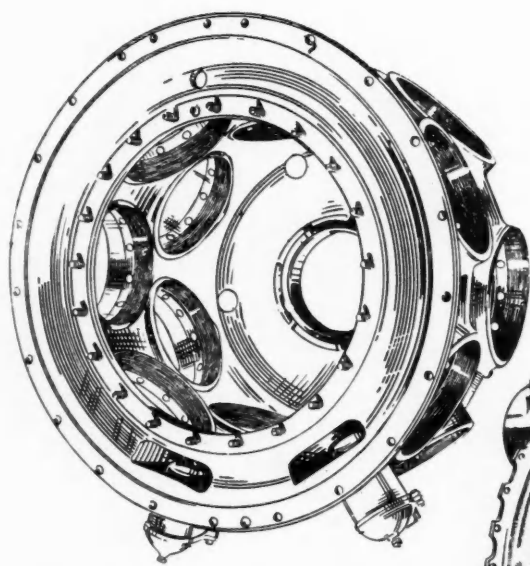
THE 14-cylinder Jaguar air-cooled radial engine produced by Armstrong-Siddeley, Coventry, England, for some years past, has been supplemented by the Jaguar Major. Although, as its name implies, the new engine is a natural development of the original Jaguar, it varies extensively in detail. Although its overall diameter is approximately the same, its power output is considerably higher. It is offered in two types, one with a geared fan to secure more uniform distribution of the mixture and provide a slight supercharging effect, the other with a centrifugal super-

increase of piston displacement from 1513 cu. in. to 1667 cu. in. At the normal engine speed (2000 r.p.m.) the power developed is 525 hp. at 3000 ft., which compares with 440 hp. obtained from the earlier Jaguar, but it can be run at full throttle on the ground for short periods to develop 600 hp. at 2200 r.p.m. The supercharged model is declared to develop 400 hp. at sea level and 500 hp. at 11,500 ft. The compression ratio is 5 to 1.

The aluminum crankcase, with its front wall integral and its rear sealed by a "diaphragm plate," carries the 14 cylinders in two staggered rows. The cylinder barrels are steel forgings machined all over, and are screwed and shrunk into the aluminum cylinder heads, the joint being completed by a nut (serving also as a radiating fin) which is threaded onto the cylinder before the latter is shrunk into the head. This nut has a taper seating, the angle at the taper being such that the nut remains tight despite the different expansion ratios of the two materials locked together.

Each cylinder has two overhead valves operated by pushrods and rockers; the inlets are of stainless steel and the exhausts of cobalt chrome. Duplex springs are fitted, and each rocker is inclosed in an easily detachable streamlined cover. Each valve with its rocker and rocker bracket lies in the plane of the pushrod so that there is no side load, enabling the rocker bracket to be of small section and offer little head resistance.

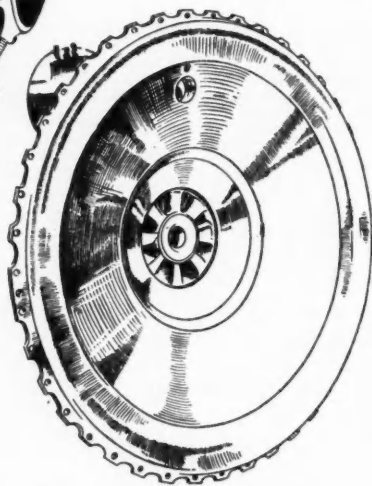
The cylinder barrels screw into steel adapters in the "mouths" of the crankcase, the adapters being flanged on



*Interior of the Jaguar Major from the rear*

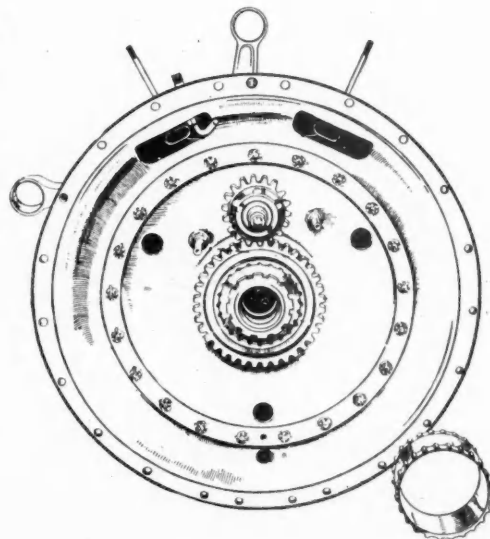
charger running at 12.9 times crankshaft speed. The supercharged model is primarily intended for use where high altitudes will be reached; at sea level its power is less than that of the model with a geared fan, this being due, of course, to the power absorbed in driving the blower.

The increased power of the new engine, which is comparable only in respect of the geared fan model with the original Jaguar, has been attained by increasing the cylinder bore from 5 in. to 5¼ in. (the stroke remaining 5½ in.), which infers an



*Front face of supercharger carrying auxiliaries on its reverse side (above)*

*The crankcase of the Jaguar Major with the rear wall (diaphragm plate) in position (right). The detached unit is the serrated coupling of the supercharger drive*



# ferred in Two Types

By M. W. BOURDON

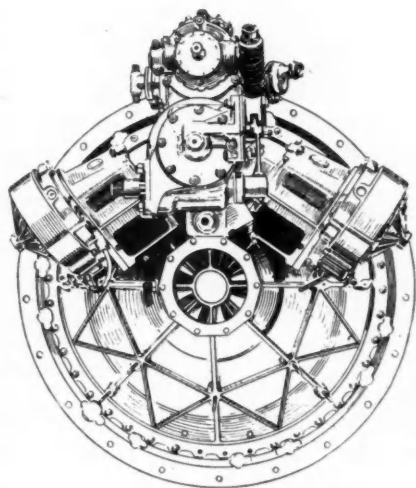
the inside of the case and pegged to it when their correct position has been determined in assembly. Each cylinder is screwed down onto a loose split ring with conical faces; when the cylinder is screwed down and in correct alignment as to valve port position, the clamping screw of the split ring is tightened, so drawing together the two tapers and rigidly securing the cylinder with an evenly distributed load all 'round the flange.

The front wall of the crankcase accommodates the front main roller bearing, of which the outer race is secured from the inside by a spring ring that fits into a groove in the housing, the latter being shrunk into the case and held by a locking ring riveted over. The guides of the cam followers are formed in pairs and equally spaced around the front of the crankcase; they are pushed into position from the outside and flange-fixed by bolts and nuts; studs are intentionally avoided, while the bolt heads inside the crankcase are flattened to prevent them from turning. The cam followers have roller ends in contact with the cams, and circlips are fitted at their outer ends to keep them in place during assembly.

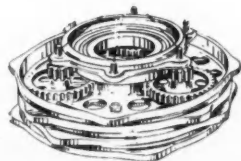
The cam drum, consisting of four rows of seven cams each, is driven by sun and planet gearing. In front of this unit is the oil pump driving bevel gear secured by studs in the cam drum. The timing gear is inclosed by the intermediate bearing housing, the phosphor bronze bearing being shrunk into the aluminum housing which forms a support for the internal gear of the airscrew drive and positions the crankshaft.

The reduction gear for the airscrew consists of the internal gear on the crankshaft driving five satellite gears, the latter meshing with the sun gear which runs free on the airscrew shaft. The cage carrying the satellite gears travels 'round the sun gear and revolves with the airscrew shaft, the sun gear meshing with a stationary gear in the cover.

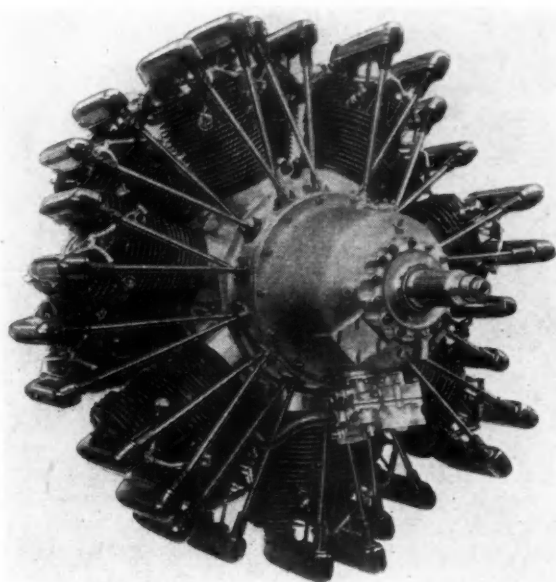
At the rear of the crankcase are two compartments. The first



*The accessories of the Jaguar Major are fixed on the rear cover*

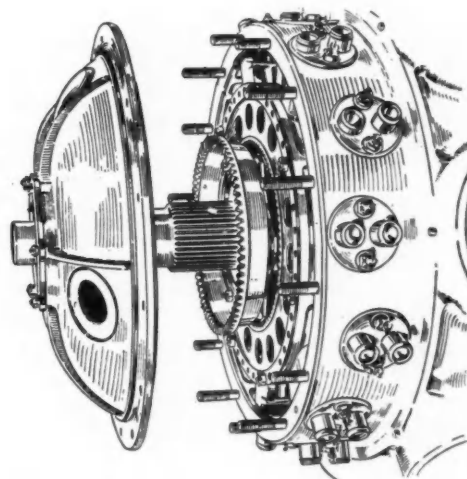


*The distribution gear and cam drum (left)*



*Armstrong-Siddeley Jaguar Major airplane engine*

to the rear of the crankcase incloses the driving gears of the fan or the supercharger, one or the other of which in turn is inclosed in the second compartment. The rearmost or induction casing cover supports the

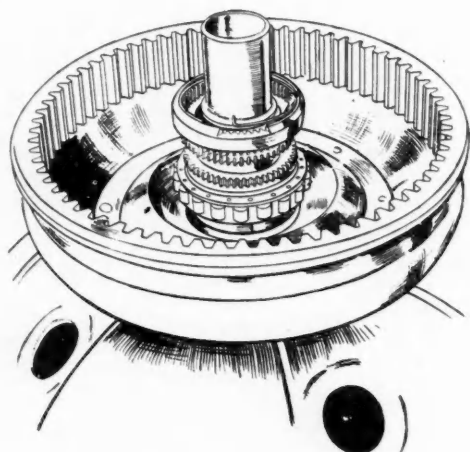


*Front end of the Jaguar Major engine, with the intermediate bearing housing partly removed. The bevel gear drives the main oil pumps of the dry sump lubrication*

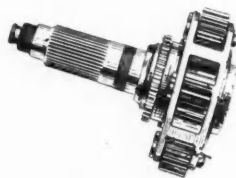
auxiliaries (magnetos, oil pumps and carburetor) and has a central hole through which the mixture is led from the carburetor. In this hole are stationary guide vanes which distribute the mixture uniformly and radially to enable it to be taken up by the blades of the fan or the supercharger and discharged through holes in the rim of the induction casing, from which seven Y branches lead to the inlet valve ports of the cylinders.

The greater part of the rear portion of the induction casing is formed with a circular polished guide face, the function of which is to assist the free radial flow of the mixture to the induction pipes. There is an annular space between the periphery of the guide face and the rim of the casing to accommodate the mixture outlet holes, to which the lower ends of the Y branch pipes are held by gland packings and gland nuts. The

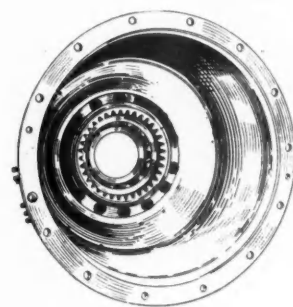




The distribution gear and cam drum (left)



Internal gear drive on the front end of the crankshaft



Reduction gear and front cover (above) of the Jaguar Major

front face of the induction case is also polished to facilitate the passage of the mixture radially from the central inlet hole leading from the carburetor.

The engine is secured to the aircraft by means of bolts that pass through holes in a flange encircling the induction casing cover.

The supercharger drive comprises a gear on the rear end of the crankshaft, driving a coupling sleeve which in turn drives the main driving gear. The latter drives three satellite back-gear wheels, which incorporate spring-loaded clutches and drive a gear on the front end of the rotor spindle. The latter rotates in the same direction as the crankshaft but at 12.9 times the speed.

In the engine with the fan drive there are two gears side by side on the rear end of the crankshaft. The front or larger one drives the auxiliary idler gear; the rear or smaller one meshes with a small pinion on the

intermediate fan gear assembly. The latter incorporates a slipping clutch consisting of phosphor bronze pads that fly outward by centrifugal force and transmit the drive. This larger intermediate wheel drives a gear on the front end of the fanshaft.

The crankshaft has two throws, with phosphor bronze balance weights bolted and riveted to the outer webs. Around each throw is one master rod with its six auxiliary rods, the master rod being held to the cap by four bolts. The shaft is hollow, its webs being sealed by duralumin plugs. The master and auxiliary rods are of H-section steel.

With two magnetos, carburetor, air intake, propeller hub and tachometer drive the geared-fan model weighs 985 lb. (1.17 lb. per rated hp.) and the supercharged model 996 lb. (1.98 lb. per rated hp.). The fuel consumption is given as 0.6 Imp. pints per rated hp. per hr.

## Graham-Paige Enters Lower Price Field

**G**RAHAM-PAIGE MOTORS CORP., Detroit, is entering a lower price field with new body models on the Standard Six chassis. These include a four-door, four-window sedan at a list price of \$845, and a four-door, six-window sedan at \$895. Both are five-passenger cars and they are to be known as the town sedan and the universal sedan respectively. The former is \$150 lower in price than any four-door sedan previously available on the new Graham chassis. Other new body models on the Standard Six chassis are the business coupe at \$845 and the rumble-seat coupe at \$895. The new models, like all other Graham sixes and eights, have laminated, shatter-proof glass in every door and window as well as in the windshield.

These new bodies are being manufactured in Graham plants at Wayne, Mich., and Evansville, Ind. They are of composite construction, and the wooden frame members, instead of being fastened with wood screws, are drawn together with heavy bolts, which are so located that they may be reached from the interior of the body by turning back the trim material or removing seat and back cushions.

Rubber dough, a new plastic material, is used liberally in the construction

of the bodies, being spread wherever wood and metal parts are joined or make contact with each other. Rubber dough is said to remain soft during the life of the car and thus to eliminate the possibility of squeaks and rattles in the body framework.

## DIESEL ENGINE'S FUTURE

(Continued from page 511)

higher cost sufficiently to make it appear superior to the gasoline engine. This depends on too many factors to allow a safe prediction. It has already penetrated in light industrial and heavy automotive fields where a few years ago the gasoline engines had no serious competitor. Time and experience alone can show us how to make the automotive Diesel as simple and reliable as it must be in order to be fully successful.

Standardization and specialization in the manufacture of its fuel-injection parts, together with modern mass-production methods, should then make it possible to sell this engine at not more than 50 per cent above the price of a modern gasoline engine of the same size.



Graham four-window sedan

## Just Among Ourselves

### Manufacturers' Control of Retail Sales Prices

WE'VE just been wondering what significance passage of the Kelly-Capper bill—which provides for control of retail sales prices by manufacturers—would have for the automotive industry. True, there seems to be little chance for the bill to get through the Senate during the present session of Congress, even should it gain the necessary support to get through the lower house. Speculating about what such a law would mean to our industry, nevertheless, is more pertinent before than after passage.

Offhand, it will occur to everyone, existence of such a law would permit car manufacturers to control the retail price of their products, as many of them have wished they could do in the past. But would that make a whole lot of actual difference in the long run?

The average f.o.b. price today, of course, is built on a basis which anticipates a certain loss as a result of trading. Ability to control the delivered price would have no effect on this one way or the other. As long as the trade-in allowance really determines the delivered price, in other words, control of the advertised delivered list price wouldn't seem to mean a whole lot except those rare events known as straight deals.

The trade-in allowance today is a far greater factor in determining the actual price paid for a given car than are the possible differences in delivered prices, thus making the latter only a subsidiary consideration.

Now if the bill somehow made possible control by the manufacturer of the actual cash payment to be received by the dealer and then all the manufacturers got together and . . . . But—wrote the Washington representative of *Automotive Industries* in our March 22 issue—"The bill clearly prohibits

agreements as to selling prices between producers, wholesalers or retailers."

\* \* \*

### Amendments Remove Effect on Automobile Situation

NO, we can't see at the moment how the passage of the Kelly-Capper bill would mean much to passenger car manufacturers and retailers.

Particularly does this seem to be true in light of the amendment attached to the bill by the House committee on Interstate and Foreign Commerce in referring the bill to the house calendar with recommendation for its passage. This amendment would provide that, despite a resale price agreement, the commodity might be resold without reference to such agreement under several conditions, among which is:

"In closing out the owner's stock for the purpose of discontinuing dealing in such a commodity or of disposing, toward the end of a season, of a surplus stock of goods especially adapted for that season."

Certainly that would leave the automobile situation just about where it now is.

\* \* \*

### Reasoning Type of Inventor Usually Gets Assistance

TALKING before the annual meeting of the S.A.E. a while back, W. J. Davidson, Executive Secretary of General Motors Technical Committee, said that out of 6000 inventions submitted to the General Motors New Device Committee, only 11 had sufficient merit to warrant serious investigation and tests.

One point brought out strongly was the desirability of trying to protect an inventor from himself; that is, of finding some means to discourage men from spending their lives and their funds attempting to develop some device without any knowledge or investigation of the pre-

vious state of the art. All of which brought to our mind the thought that normal common sense provides a certain protection for all of us which no legal forms or outside advice ever can give. It does seem as though the reasoning type of inventor usually can get relatively good advice about the actual merits of his device.

The inventor with the idea that the world is banned against him, however, does find difficulty in getting advice, because often what he really is looking for in some cases is confirmation of his own ideas about the device—which is one reason why a certain type of inventor falls an easy prey to the unscrupulous.

\* \* \*

### For Each Ford Model A Sold a Model T is Scrapped

THE office statistician has had his pencil working again and presents us with the following interesting lucubration:

Every time a new Ford Model A is sold, a Model T is scrapped.

At least that is approximately what the latest available registrations figures indicate. On July 1, 1928, there were 8,702,726 Ford cars and trucks registered. During the next 12 months, new Fords registered totaled 1,207,430. Hence, if no Fords were scrapped during this period, there would have been 9,910,156 registered on July 1, 1929. Actually, however, Ford registrations on that date were 8,714,620. The difference amounts to 1,195,536 which represents the number scrapped and presumably they were practically all Model T's.

Comparing the number scrapped during this 12-month period with the number of new Ford trucks sold, as indicated by registrations, sales amounted to only 11,894 more than the scrappage. Hence it is approximately correct to conclude that for each Model A sold, a Model T is scrapped.—N.G.S.

# International Harvester Adds Two to Its Line of Trucks

*Model A-5 and Model A-4, rated at 3 and 2 tons respectively, are powered by six-cylinder engine of the company's own design and make, featuring removable cylinder liners.*

TWO new models have been added to the line of trucks of the International Harvester Co. of Chicago, the Model A-5, rated at 3 tons, and the Model A-4, rated at 2 tons. Both have six-cylinder engines and are equipped with pneumatic tires. The engine is of the company's own design and built in the Fort Wayne works, and it incorporates the rather unusual feature (for truck engines) of removable cylinder liners. A 5-speed transmission, spiral-bevel-gear final drive, semi-floating rear axle and four-wheel mechanical brakes are features that are common to both models.

The Model A-5 is regularly equipped with 34 by 7 in. pneumatic tires, duals being fitted at the rear, while the Model A-4 is equipped with 32 by 6 in. tires, duals at the rear. Except for length of wheelbase and rear axle ratio the major specifications of the two models are alike.

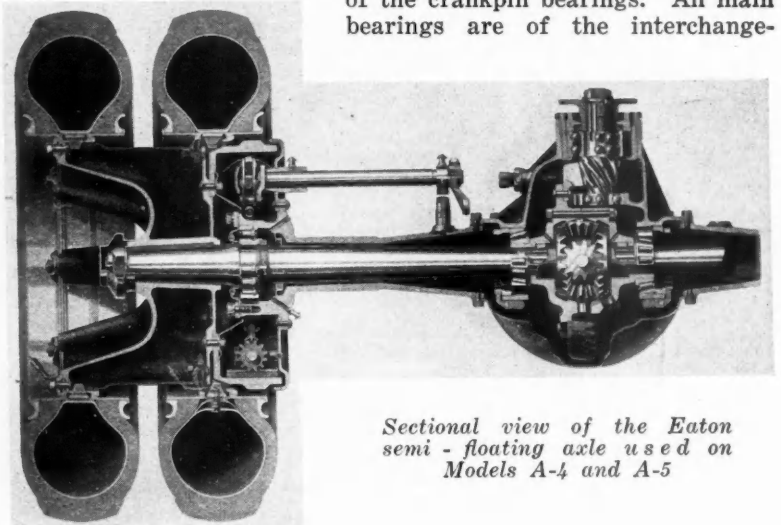
The engine has a bore of  $3\frac{5}{8}$  and a stroke of  $4\frac{1}{2}$  in., giving it a piston displacement of 279 cu. in., and develops 65 hp. at 2800 r.p.m. Its maximum torque of 165 lb.-ft. is developed at between 1100 and 1400 r.p.m. It is specially designed for truck work and has large bearing areas throughout. The valves are located in the removable cylinder head and the cylinders are provided with removable sleeves which—since they are machined both inside and out—not only assure more nearly uniform cooling but permit of the replacement of individual liners in case of injury to the bore. On top of the cylinder head there is a similar casting, also of gray iron, which forms the valve and rocker arm chamber and also the water-outlet fitting. This upper section is bolted to the lower section and is provided with a pressed-steel cover.

Combustion chambers are completely machined, so that the same compression is maintained in all cylinders. All valve pockets and the spark plug bosses are completely surrounded with water. Valve stem guides of gray iron are pressed in place and can be easily renewed. The cylinder head is held down to the cylinder block by means of 24 heat-treated  $\frac{1}{2}$ -in. steel studs, with a copper-asbestos gasket in between.

The upper half of the crankcase is cast integral with the cylinder block, while the lower half is another iron casting. All of the seven main bearings are carried by the upper half. To provide a rigid support for the crankshaft, each bearing is bridged over and anchored to the side wall of the crankcase. Cylinder liners are cast of close-grained iron and machined

both inside and out, the bore being given a very smooth finish by grinding. A water-tight joint is effected at the lower end of the liner by means of a rubber ring in a groove turned in the cylinder block, while at the upper end the copper-asbestos gasket assures such a joint. The cylinder liner wall being of uniform thickness, will expand and contract uniformly, which assures improved bearing conditions for the pistons.

The crankshaft has a main-bearing diameter of  $2\frac{1}{2}$  in. and a total main bearing area of 32.57 sq. in. It is drop-forged of chrome-nickel steel and machined all over. All bearing journals are ground and then polished. Oil holes are drilled through the crank arms diagonally for the lubrication of the crankpin bearings. All main bearings are of the interchange-



Sectional view of the Eaton semi-floating axle used on Models A-4 and A-5

able steel-back, babbitt-lined type. They are doweled to the caps and upper half of the crankcase and are held in place by heat-treated studs of alloy steel. The bearing caps, which are cast of gray iron, are heavily ribbed so as to maintain their cylindrical form under load. To assure proper alignment of all bearings, the bearing bores are line-reamed before the bearing shells are assembled. Since the bearing shells are of the interchangeable type, no shims are provided.

A separate steel starter ring gear is fitted to the flywheel rim, the flywheel itself being secured to an integral flange on the crankshaft by means of six heat-treated alloy-steel bolts. Behind the flange and integral with the crankshaft is a large oil slinger. A right-hand helical groove between the slinger and the flange on the crankshaft contacts with cork inserts, thus providing a seal against leakage of oil from the



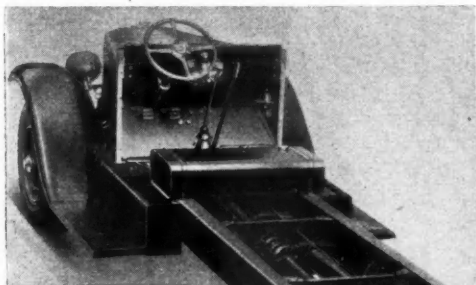
## Chassis Models

crankcase into the clutch housing which latter is bolted to the upper half of the crankcase.

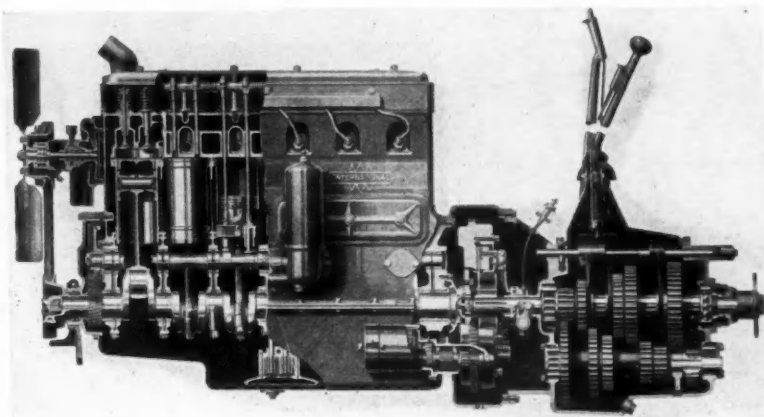
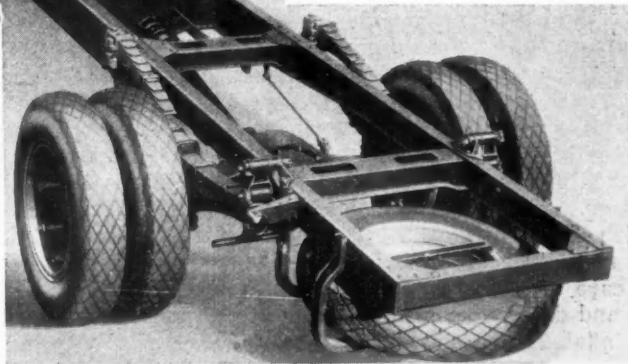
The camshaft has its bearings stepped, so it can be withdrawn from the front of the crankcase. It is drilled through its entire length and forms the main distributing passage for the lubricating oil, thus eliminating the need for any tubing inside the crankcase. Camshaft bearings are of the steel-backed, babbitt-lined type; they are pressed in place, line-reamed, and held in the crankcase by dowels.

The exhaust valves are made of silchrome steel, the inlet valves of a high carbon alloy steel. The valve port diameters are  $1\frac{1}{2}$  in. and  $1\frac{5}{8}$  in. for the exhaust and intake respectively. Both the intake and exhaust manifolds are cast of gray iron and rigidly held to the cylinder heads by studs. The intake manifold is located above the exhaust manifold and receives some of the heat of the latter, which assists in vaporizing the fuel. The carburetor is of the compound-jet, vertical type, of  $1\frac{1}{8}$  in. size, and is bolted to a flange on the vertical intake riser which passes through the exhaust manifold in such a way that the exhaust gases from three exhaust ports pass around it. The flow of the exhaust gases around the inlet riser can be controlled by means of a heat-control valve built into the exhaust manifold.

Rocker arms are drop-forged of alloy steel and case-hardened. They are provided with bronze-bushings and drilled through one end for lubrication of the pushrod balls and sockets. The ends over the pushrods are provided with adjusting screws. The rocker arms are actuated by mushroom-type valve tappets



Three-quarter rear view of International Harvester truck chassis



Unit powerplant, partly in section, designed and built by the International Harvester Co. for the new trucks

through tubular pushrods. The valve tappets are made with chilled cast-steel heads welded to tubular, hardened steel stems. Tappets, guides and pushrods are housed in a chamber on the left-hand side of the cylinder block. Two pressed-steel cover plates, held in place by studs, provide easy access to six tappets each.

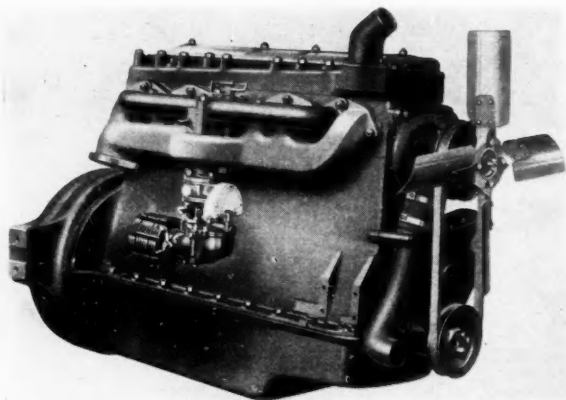
The crankshaft gear and the generator drive gear are cut from steel forgings, while the camshaft gear is made of a compressed fabric with a steel hub. Helically cut gear teeth and the use of a compressed fabric gear on the camshaft are said to assure quiet operation even at high speeds. End thrust on the camshaft gear in either direction is taken up by a bronze washer.

The cast-iron pistons are of light design, with ribbed heads. They are annealed to prevent distortion in service, and they are made unusually long to reduce the specific pressure against the cylinder wall. Pistons and connecting rods can be removed through the bottom of the crankcase without removing the crankshaft therefrom. Each piston carries four rings, three  $\frac{1}{8}$ -in. compression rings and one  $\frac{3}{16}$ -in. oil wiper ring, all above the bosses. The rings are made of individual castings, are concentric, and have a 30-deg. diagonal joint.

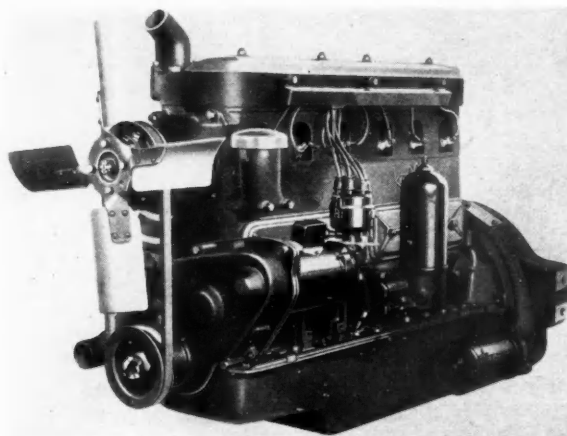
The tubular alloy-steel piston pins are case-hardened, ground and polished. They float in diamond-bored bearings in the piston bosses and in the connecting-rod bushings. The pins are secured against endwise motion by snap-ring retainers. Connecting rods are of I-section, drop-forged of high carbon steel and heat-treated. The babbitt is spun in the lower bearing after the latter is rough-bored and the babbitt is then diamond-bored. Shims between the

cap and the half of the bearing integral with the rod permit of easy adjustment. The caps are held in place by two heat-treated alloy-steel bolts. A slot milled through the upper part of the bearing provides for its lubrication. Connecting rods are weighed at both ends and are grouped in sets of substantially equal weights at corresponding ends.

The gear-type, gear-driven pump is located in the sump. It delivers oil under pressure through drilled holes in the crankcase, to the oil filter, which is mounted on the outside of the crankcase. After the oil passes through the



Right side (above) and left side views of the International Harvester truck engine



filter it is delivered to the camshaft and through holes in the camshaft bearings, which are connected by drilled holes in the crankcase to all main bearings and through passages in the crankcase to all connecting rod bearings. An intermittent oil supply is forced through drilled holes in the cylinder block and the hollow cylinder head stud to the tubular rocker arm shaft. This lubricates the rocker arm bushings and passes through a hole in each rocker arm onto the push-rod balls and sockets. The overflow from the rocker arm shaft returns to the crankcase through the push-rod holes, lubricating the valve tappet on the way down. Timing gears are lubricated through the front camshaft bearing.

Delco-Remy battery ignition is regular equipment but a high-tension magneto can be supplied as an option at extra cost.

A built-in vibration damper is incorporated in the 11-in. single plate clutch. Mounted in unit with the clutch is the transmission, which provides five forward speeds and one reverse. All speeds are controlled by one shift lever. A standard take-off opening is provided on each side of the transmission case for the mounting of power take-offs.

Three wheelbases are available for the 2-ton Model A-4: 145, 170 and 185 in. On Model A-5, four wheelbases are available: 156, 170, 190 and 210 in. The 156-in. wheelbase accommodates 2½ yd. dump bodies, 9 or 9½ ft. long, while the 190 and 210-in. wheelbases accommodate 15 and 17½ ft. bodies respectively.

Service brakes are of the internal two-shoe, self-energizing type. One-quarter elliptic rear helper springs are used with long flexible main springs.

## Peerless Centralizes Plant Facilities

(Continued from page 513)

Sheet metal parts, such as fenders, splashers and hoods, are cleaned, polished and completely finished in a special department on the main floor. The metal parts are first passed through a burn-off oven which frees the surface of all dirt, moisture and grease. Upon leaving the oven these stampings pass through a cleaning bench where the final grinding, polishing and buffing operations are accomplished.

Evidently much thought was given to the layout of the enameling department. It is totally enclosed and fully protected by air conditioning apparatus. As an added precaution they have provided an entrance lobby through which one must pass before entering the enameling room. The paint department has been separated into two major divisions. The first is arranged to handle the entire set-up of the enameling of fenders; the second, which is entirely separated from the first department, handles all of the color lacquer work on hoods and other parts that require color.

Wheels are finished and fitted with rims, tubes and tires on the second floor of Plant 1. A considerable saving in floor space has been effected in the baking oven installation by drying the wheels in tiers. This oven is of their own design and is fitted with channel slides which guide the rolling wheels at the rim. The slides are made in several spacings to take care of all sizes. After the wheels have been lacquered and dried, they are fitted with rims, tubes and tires, inflated to

the proper pressure, and finally the completed assembly is dropped down the wheel chute to the main assembly line.

As the finished car rolls off the final assembly line it is driven under its own power to the final test department. Here they have provided two floor pits, one fitted with a Cowdrey Brake Tester, the other for final inspection. The Cowdrey brake tester is of conventional design with the exception of the pit which, of course, conforms to their own layout. This pit, like the one in the assembly department, is clean and well-lighted by means of recessed lamps. The physical idea of cleanliness is carried out further by concealing or recessing all wiring, lamps, and power outlets. The final test department also is provided with washing equipment for thoroughly cleaning the car before delivering it to the shipping department.

To the interested observer, the part that good management has played in this layout is immediately evident. Following the best practice in automotive plants today, all minor sub-assembly operations and temporary storage of parts, are located along assembly lines as close as possible to the point of usage. The general cleanness of appearance, and by that is meant the absence of air lines, dangling wires, and exposed electrical wiring, indicates thoughtful prearrangement. The elements of safety are apparent in every detail, particularly in the arrangement of the conveyors themselves.

# Sales Quota Principle Misunderstood

By R. H. GRANT

Vice-President, General Motors Corp.

MUCH has appeared in print recently regarding the evils of the "Sales Quota." Much of what has been said is unfortunately true. The evil, however, is not in the sales quota principle, but in the erroneous application of the principle.

The term "Sales Quota" means (or at least should mean) *that portion of the business in a given territory which the individual manufacturer may reasonably expect to get.*

Under the terms of this definition we must consider the economic characteristics of the territory, the past performance of the automobile business in the territory, the ability of our dealer in relation to competitive dealers and the status of his financial operating position.

The aggressive marketing practices of the industry have frequently led to the forcing of cars beyond the bounds of sound economics, and it seems obvious that this is against the best interest of the manufacturer as well as the dealer, for while the dealer may be penalized more acutely and more quickly, the manufacturer is inviting bankruptcy in that territory and the expense of reorganizing and living down the stigma associated with the local failure far outweighs the fallacious advantage of temporarily overselling the market.

And yet sales aggressiveness is essential under the modern competitive conditions. If the automobile industry had followed a passive course it could never have played so important a role in contributing to American industrial prosperity.

The phrase "consumer demand" has little more than an academic meaning, except as applied to such fundamental physiological necessities as food, shelter and clothing in their most simple and elementary forms. When we get beyond that, we must inevitably recognize the necessity for sales pressure of varying degrees. In fact, to assume any different stand is to attack the entire scheme of modern industry and our existing ideas of progress, cultural advancement, higher standards of living, and cultivation itself. To be sure, many retail merchants in various lines have suffered heavy financial losses as a result of having merchandise forced upon them, and the automobile business is no exception.

Of course, it may be argued on the other side of the question that many dealers operating big and profitable businesses would have never gotten beyond the shoe-string stage, had it not been for the manufacturers' insistence on an aggressive and intensive sales policy. But the time has come when the far-sighted manufacturer can ill afford to find consolation in the more favorable aspects of the case.

Any dealership which does not make money is a danger point, threatening the future security of the manufacturer whose line the dealer represents.

But the remedy is not to be found in the abandonment of the sales quota, nor in the adoption of a less aggressive sales policy. The difficulty lies, not in the principle, but in a misapplication of the principle,

due to a lack of facts or a lack of far-sightedness.

The automobile industry is thirty years old, but from a standpoint of merchant-management, it is still in its swaddling clothes and incidentally the same can be said of many far older industries.

Knowing as I do the things that are going on in the minds of our biggest executives, we of the automobile industry are destined to make contributions to this new science of merchant-management ranking in significance with our contributions to the sciences of mechanical design, modern efficiency and lower costs through quantity production.

Without attempting to make excuses for the thirty years' delay let me remind you that from the beginning, the business of merchandising automobiles has attracted the dramatic sales type rather than the conservative, analytical individual. It is to this first type of individual, at our factories as well as in our dealerships, that we owe the spectacular progress of the industry, and in no industry have these admirable traits been so liberally rewarded.

But we are entering a new era. We, in common with other stabilized businesses, have reached a point where the profit margins are no longer wide enough to permit of loose management. Aggressive sales enthusiasm must be counterbalanced with sound business planning based on adequate facts. The successful dealer of the future will apply the same intensive effort in his budgetary planning as he does to his sales technique—and the far-sighted manufacturer, in the control of his production schedules and in the development of his dealer policies, will take full cognizance of the facts disclosed by the dealers' accounting records.

It would be unfortunate indeed if the demands of this new era were to stifle the intense enthusiasm and aggressiveness which have served our industry so well, and it is my prediction that the big rewards will continue to go to the sales type of individual whose aggressive enthusiasm and resourcefulness will be applied to the problems of retail management through scientific control on the basis of adequate facts.



R. H. Grant, vice-president, General Motors Corp.

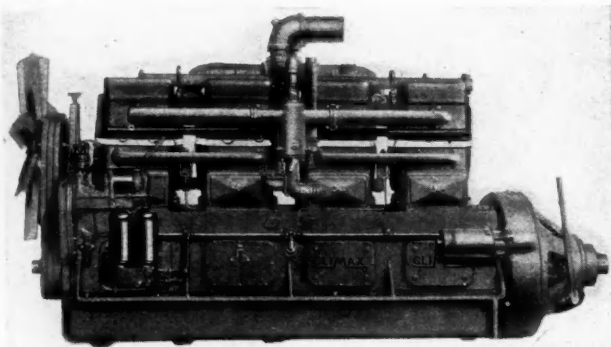


# NEW DEVELOPMENTS—Automotive

## Climax Engine

THE Climax Engineering Co. of Chicago, Ill., announces the completion of a "straight eight" valve-in-head engine of 6-in. bore and 7-in. stroke. It embodies most of the features of the company's Blue Streak model.

The engine is said to develop more than 200 hp. at 1000 r.p.m. and 225 hp. at 1200 r.p.m. The torque curve peaks at 600 r.p.m., showing 1145 lb.-ft. at this speed.



*Climax eight-cylinder 200 hp. engine*

The b.m.e.p. is over 100 lb. p. sq. in. at recommended speeds and the fuel consumption is said to range below 0.6 lb. p. b.hp.-hr.

The new model, known as the R81, is a triple-fuel engine, handling distillate and natural gas as well as gasoline.

Lubrication is by force feed and three oil pumps are provided. All oil is passed through a duplex oil filter before entering the bearings, while the oil entering the overhead valve system is cleaned in a special strainer.

Cooling water from the large centrifugal pump enters the cylinder jackets at the top, permitting of thermosiphon circulation within the jackets. An eight-blade 36-in. fan with triple V-belt drive is incorporated in the design, as are special mountings for a tachometer, a fuel pump and other accessories.

The engine is equipped with two Zenith carburetors, a governor, a magneto and dual ignition. Two Leece-Neville starting motors, one on each side of the engine, are used for starting purposes.

## Industrial Hydrogen Substitute

AN industrial gas called Electrolene, which is said to be better than hydrogen in many applications, can now be produced by feeding steam and city gas or other hydrocarbons into an electric cracking device developed by the General Electric Co. This gas, according to an article by F. P. Wilson, Jr., in the *General Electric Review* for April, can be made at about a tenth of the cost of hydrogen, and is expected to be of special value when used in electric furnaces with controllable atmospheres, in heat-treating processes, brazing, etc., and also in metal cutting and other industrial applications.

The heat necessary for the cracking is generated electrically. The cracking device occupies but a small amount of space, its size varying according to the amount of gas required. A typical installation for pro-

ducing 1500 cu. ft. per hour would be in the form of a cylindrical shell 7 ft. in diameter and about 10 ft. high.

The principal advantage of using the new gas is said to be the low cost involved in the manufacture and the maintenance of the equipment. An installation now in use at the Schenectady plant of the General Electric Co. has a capacity of 1000 cu. ft. per hour and produces gas for less than \$1 per thousand cubic feet overall. An equivalent gas if purchased would cost approximately \$10 per thousand cubic feet.

Other advantages claimed for the new process include the small amount of floor space required for the equipment, the small amount of attention required, and the flexibility of output, application, operation, etc. Gas can be produced as required up to the limits of the equipment, no storage being required. One of the first practical applications of the new gas producer is to the process of brazing in a hydrogen atmosphere.

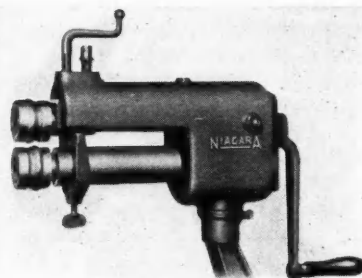
Electrolene is composed largely of hydrogen and carbon monoxide. Small percentages of methane and nitrogen are also present, but carbon dioxide, illuminants and oxygen, originally present in the city gas, are absent from the cracked product. The characteristics of the cracked gas can be varied somewhat in actual manufacture, if necessary.

## Niagara Beading Machine

THE Niagara Machine & Tool Works, Buffalo, N. Y., recently has placed on the market the No. 193 Niagara Beader for use in beading operations on sheet metal. This machine is arranged for direct drive and

will handle up to No. 22 gage metal. A throat of 8¼ in. from the center of rolls to the frame is provided; the rolls are 2⅜ in. in diameter, and 1¾ in. long.

Rolls are of high grade steel, case hardened, and are held in place with countersunk nuts, keeping the faces



*No. 193 Niagara Beader*

flush with the ends of the shafts. A polished faced gage with a large gaging surface is held rigidly in the desired position with a thumb screw. It is accurately fitted and can be readily adjusted at will. The upper shaft is raised and lowered by means of a quick-acting crank screw.

This machine is supplied complete with one pair of ¾-in. O.G. beading rolls, one pair of 5/16-in. single beading rolls, bench standard and wrench. Weight of machine boxed, ready for shipment, 90 lb.

## Striping Gun

AMONG the many interesting inventions designed to cut down production costs in the automotive industry and at the same time improve quality is a device

# Parts, Accessories and Production Tools

known as the striping gun used by Studebaker in its South Bend factory.

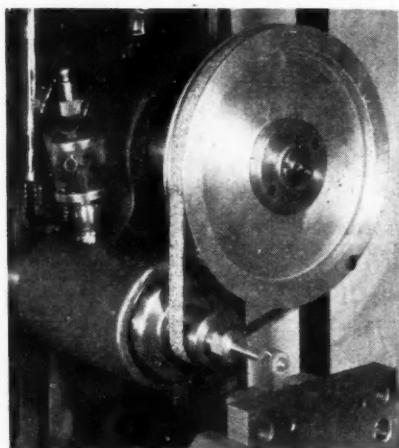
The striping gun, as the name implies, is employed for striping in the final finishing of cars—a job which formerly was accomplished laboriously by a highly skilled hand. Though of small proportions—the entire device fits snugly into the palm of an average man's hand—the striping gun does perhaps more to speed up work and cut down manufacturing costs than any other machine of its size and weight.

The gun consists of a container for paint, a diminutive pump, a nozzle and a guide wheel. A feature of its simple construction is found in the direct gearing of the guide wheel with the pump, assuring a constant, uniform flow of striping fluid irrespective of the speed at which the device is operated.

## Ex-Cell-O Installation

ALTHOUGH the Ex-Cell-O grinding spindles were developed primarily for internal grinding, they are finding, according to the Ex-Cell-O Aircraft & Tool Corp., an increasing application to other uses. The

accompanying photograph shows an installation of one of these high speed spindles on a Brown & Sharpe surface grinder. This installation, made at the Garman Tool & Die Co. plant in Detroit, consisted of removing the grinding wheel, attaching a special bracket to the grinder arbor housing, and replacing the wheel itself with a pulley. The bracket carries



Ex-Cell-O spindle on high-speed grinder

ries the high speed spindle, both being available from the Excello company.

The tool is used for rapid grinding of small radii in gages, etc. Since the entire installation is of the quick removable type, the usefulness of the machines as a surface grinder is not invalidated.

## Kinner Airplane Engine

WITH the introduction of its new 190 hp. five-cylinder air-cooled radial airplane engine, designated Model R-715, the Kinner Airplane & Motor Corp., Glendale, Cal., enters a higher power field, having devoted all of its energies heretofore to the 100 hp. model.

The new model has 715 cu. in. piston displacement, weighs 415 lb., has an overall diameter of 50 in. and an overall length (without starter or generator) of less than 35 in. Its design is substantially the same as that of the smaller model. It is of lower specific weight than the smaller model and has the added advantages of having provision for standard starters, electric generator

and fuel pump. There is said to be nothing experimental about this engine. The bore and stroke is 5 $\frac{5}{8}$  by 5 $\frac{3}{4}$  in. and the compression ratio 5.3 to 1.

Airplanes to which the new Model R-715 is adapted include many of the larger sport, advanced training and four and five-passenger cabin types.

Emphasizing the simplicity of the design the makers point out that the engine has only five cylinders, the inductor system is without superchargers or rotary induction, that accessories are driven by simple spur gears, that "plumbing" is held to a minimum, and that plain bearings

are used throughout except for a deep-groove-type ball thrust bearing. A Stromberg carburetor is fitted, as are two Scintilla magnetos.

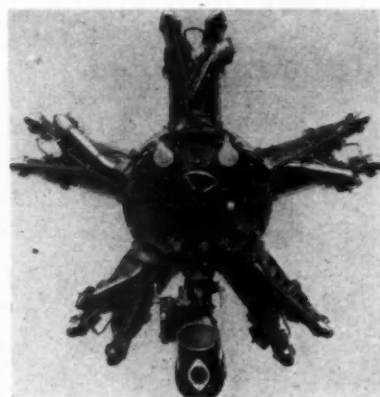
Provision has been made for the use of standard starters. The provision of a standard drive for an electric generator makes possible the use of electric-type starters, a lighting system, radio, etc. Provision of fuel pump drives permits considerable latitude with respect to the fuel tanks. However, the carburetor location is such that a simple gravity fuel system can be used. The engine can be obtained with a nose-type collector ring if desired.

We understand that the engine is to be subjected shortly to the test for the Department of Commerce approved-type certificate.

## Aluminum Rolled Shapes (Correction)

A NUMBER of inaccuracies crept into the article on the aluminum-shape rolling plant of the United States Aluminum Co. at Massena, N. Y., in our issue of March 8. The tensile strength of the alloy usually employed for the rolled shapes is not 45,000-50,000 but 50,000-55,000 lb. p. sq. in. The modulus of rigidity of aluminum is generally taken at 10,000,000 instead of 12,500,000 lb. p. sq. in. and the 72-ft. crane deflected 1 in. under a load of 17 tons, which was two and one-quarter times as much as the deflection of a similar steel crane. In the article it was stated that the deflection was imperceptible, which, of course, is somewhat indefinite.

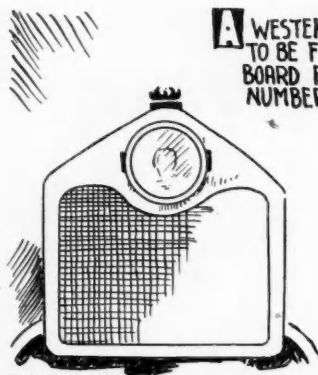
THE layout of overhead conveyor systems, together with notes on the design factors involved, are discussed in detail in Bulletin No. 30A, prepared by the Anchor Steel & Engineering Co., Detroit, Mich. A detailed mathematical analysis of a typical problem is given as a key to the solution of related installations. This is supplemented by an interesting treatment of such elements as turns and conveyor lubrication.



Accessories side of Kinner Model R-715 engine

# Automotive Oddities

by Pete Keenan



**T**HE ONLY CAR BUILT WITH ONE HEADLIGHT THE BRISCOE Oct. 1913.

**A** WESTERN INVENTOR WANTED ALL AUTOS TO BE FITTED WITH A DEVICE ON RUNNING BOARD, FENDERS AND BUMPERS CONTAINING A NUMBER OF HOLLOW BALLS WITH CAR NUMBER ETC. INSIDE TO CATCH HIT AND RUN DRIVERS.



**MOTOR STABLE**  
COMPETENT MECHANICS  
ALWAYS ON HAND  
TO MAKE  
REPAIRS



**P**AUL E. HOVGARD A TEST PILOT OWES HIS LIFE TO THE FACT HE WAS ABLE TO LAND A PLANE WITHOUT A TAIL FROM A HEIGHT OF 4000 FEET

Bristol Pa 1927.



**O**N JUNE 1899 N.Y. HAD IT'S FIRST GARAGE OPENED BY THE AMERICAN MOTOR CO. AT 213 W. 58<sup>th</sup> ST.,

Pete Keenan



**W**HEN THE SANTA ANA WALLOWED HELPLESS AT SEA WITH HER GENERATOR DEAD. THE BATTERY FROM AN OLD FLIVVER SENT OUT THE S.O.S. AND SAVED 35 LIVES Dec 1929.



# News of the Industry

PAGE 525

VOLUME 62

Philadelphia, Saturday, March 29, 1930

NUMBER 13

## Parker Bus Bill Expected to Get Senate Approval

House Amendments to Regulatory  
Measure Are Minor

WASHINGTON, March 27—The fact that the Parker motor bus bill passed the House on Monday of the present week by the wide margin of 218 to 115 lends support to the prevailing view that it will be passed by the Senate. But it is doubted that the Senate will act upon the bill at the present session.

As passed by the House the bill was amended only in relatively minor respects from the form in which it was reported by the Committee on Interstate and Foreign Commerce. The principal amendments adopted are designed to maintain supervision over bus lines by state boards to a somewhat greater degree than was proposed in the original draft. Through amendments offered by Representative Mapes, Republican, of Michigan, supervision would rest with state boards where routes do not penetrate more than three states and discretionary authority is given the Interstate Commerce Commission, the governing body over lines penetrating more than three states, to refer proceedings to state boards where not more than three states are involved.

The bill would permit the Commission to issue certificates to applicants if operating on March 1, 1930. Previously the date was Jan. 1.

## Stutz Prices Increased

NEW YORK, March 26—Increases in the price of all Stutz model automobiles, averaging approximately \$300, will become effective April 1, according to announcement last night by E. W. Headington, vice-president in charge of the Stutz New York Co. There is no change in price in the Blackhawk models.

"We are merely following the general trend in the industry," Mr. Headington explained. "Other leaders have found the need for similar action. Our volume this year is not so great, and in order to realize a reasonable profit we must raise the price per unit."

## Buys Toledo Company

TOLEDO, March 25—Briggs & Stratton Corp., Milwaukee, has purchased the Loolift Co., of this city, patent holding corporation of a window-lifter.

## Alfred Reeves Says—

NEW YORK, March 25—Alfred Reeves, general manager of the National Automobile Chamber of Commerce, speaking before the sales managers of motor companies in Detroit this week, outlined seven factors which he considers as contributing to renewed activity in the automobile trade. These factors are:

1. Good spring weather.
2. Moderate prices of 1930 models.
3. Style and beauty features of current cars.
4. Many mechanical improvements.
5. Dealers rapidly clearing stocks of old cars.
6. Replacement market which will approach 3,000,000 cars this year.
7. Rising curve of general business.

## Voting Trust Proposed to Reo Stockholders

DETROIT, March 25—A voting trust to lodge stock voting power of Reo Motor Car Co., Lansing, in the hands of R. H. Scott, president, William Robert Wilson, recently appointed general manager and a director, and D. E. Bates, secretary-treasurer, has been proposed. The trust will constitute a three-year proxy vested in the trustees, according to W. S. Foster, legal representative. He said, "With current quotations on Reo stock considerably less than the par share book value of the property, the situation presents a tempting opportunity to large stock jugglers."

Stockholders will be asked at the annual meeting, next Tuesday, to exchange stock for "voting certificates" which will be traded on the Stock Exchange exactly as shares of stock are traded. Stock certificates will be held by above named trustees.

Reo stock was active yesterday, reaching a new high for this year.

The annual statement signed by Mr. Scott and R. E. Olds, chairman of the board, pointed out that Reo is one of the few companies whose United States registrations during the year exceeded production substantially, not including exports, indicating reduced stock.

## Survey Group Sees Sales Improvement

Managers' Committee Also  
Heralds Better Factory-  
Dealer Relations

DETROIT, March 26—That automobile sales while spotty are generally improving under the stimulus of the advent of spring weather, that the aggregate production this month will exceed that of February by some 10 or 15 per cent with further seasonal advances in April and May, and that improved factory-dealer relations are widely evident as the greater selling season approaches, were the high lights of discussion at the regular survey meeting of the sales managers' committee of the National Automobile Chamber of Commerce here yesterday. Twenty-five sales executives from the member companies attended the meeting, at which R. H. Grant presided as chairman. A. L. Reeves, general manager of the chamber, also was present.

The highway safety program involving the junking of some fifteen million dollars of used cars took a prominent place in the discussion. It was revealed that 10 member companies have entered the plan actively, and that others are making careful study and contemplation of it. Warren E. Griffith, former president of the National Automobile Dealers Association, and C. A. Vane, general manager of the dealer body, attended the luncheon following the meeting, as guests of the chamber, and the seven points of factory-dealer relations brought up by the dealer body in Chicago were discussed.

Three major points in particular were discussed: 1. Importance of conveying to the public the significance of the list price of an automobile (the list price as it differs from the net price after used car trade). 2. Importance of a continuation of improvement in dealer confidence and morale. 3. The reduction of use car handling. It was reported that used car sales are showing notable improvement and that dealers' stocks in this class of merchandise are being steadily reduced, particularly in regard to dollars invested by dealers in such stocks. The reduction in actual number of units of used vehicles on dealer floors has not been so pronounced.

# Men of the Industry and What They Are Doing

## Rockelman Resigns

The resignation of Fred L. Rockelman as general sales manager of the Ford Motor Co. was announced March 25. Mr. Rockelman has served the company in various capacities for the past 26 years, coming to Detroit to be general manager of the Detroit, Toledo & Ironton Railroad which was sold by Ford interests last year. Before coming to Detroit, he managed branches in Seattle and Indianapolis. He became general sales manager in 1925.

## AC Appoints Hanson

Miles G. Hanson, process engineer of the AC Spark Plug Co., Flint, Mich., has been appointed assistant works manager, according to an announcement by Harlow H. Curtice, president. He will also retain his present duties.

He went to Flint three years ago, engaging in the work of putting new AC products into production. He served as an engineering apprentice for six years in England, later graduating from Bradford Technical University, London. Mr. Curtice also announced that the AC service department will operate as a division of the sales department, with Sumner S. Howard continuing in the capacity of service manager and working with W. S. Isherwood, sales manager.

## Shanks Joins McCandlish

Charles B. Shanks, for many years connected with the Chilton Class Journal Co. in various sales executive capacities, has become sales manager of the McCandlish Lithograph Corp. of Philadelphia. Mr. Shanks was the first man ever to hold the position of advertising manager in the automobile industry, gaining this distinction when he assumed that position under Alexander Winton in the old Winton company. He was prominent in early races and endurance runs, and later served as advertising executive with the Anderson and Rollin companies.

## Chrysler Appoints Ward

Herbert O. Ward has been appointed advertising manager of the Chrysler Export Corp., succeeding David H. Decker. Mr. Ward was formerly an executive in the Central Advertising Department of the Chrysler Corp. Mr. Decker has accepted a position in the export publishing field.

## C. M. Day Resigns

Clarence M. Day, general manager of the Jaxon Steel Products division of the General Motors Corp., of Jackson, Mich., has announced his resignation, effective May 1. Mr. Day, who has been in charge of the plant since 1917, expects to remain in Jackson, he said. His successor has not yet been named.



**Louis J. Kanitz**

W. R. Angell, president of Continental Motors Corp., has announced the appointment of Mr. Kanitz as general sales manager, a newly created position. He joined the Continental Motors Corp. in 1920, after resigning his commission as Lieut. Commander in the United States Navy.

## Federal Appoints House

The Federal Motor Truck Co. has announced the appointment of Thomas M. House, former head of the Republic Truck Co., as district manager of the company's Pacific Coast territory. Mr. House became associated with Studebaker in 1905. In 1915 he joined Republic as eastern representative. Three years later he became Pacific Coast manager for Republic, and the following year was appointed general sales manager. In February, 1929, he was made head of the company.

## Brown is Elected

Don L. Brown, vice-president in charge of manufacturing of the Pratt & Whitney Aircraft Co., has been elected president of the United Airports of Connecticut, Inc., and will have charge of the airport adjoining the new aircraft engine plant and Chance Vought Corp. airplane factory recently completed in East Hartford.

## Grulach Leaves Durant

The resignation of W. J. Grulach as assistant traffic director of Durant Motors, Inc., was announced at the factory in Lansing recently. No successor has as yet been named. B. C. Sproul, recently appointed traffic director, said, but an announcement is expected in about a week.

## Grimm Appoints White

John E. Grimm, Jr., vice-president in charge of sales of the General Motors Radio Corp., Dayton, Ohio, has announced the appointment of R. H. White as advertising and sales promotion manager. Before joining General Motors Radio, Mr. White was assistant advertising manager of the Chevrolet Motor Co., where he was associated with Mr. Grimm, when he was its advertising manager. He was previously advertising manager of Delco Light Co. at Dayton.

## Shidle is on Radio Program

Norman G. Shidle, vice-president, National Conference of Business Paper Editors, and directing editor of the Chilton Class Journal Co., Philadelphia, will be one of the speakers over the Columbia Broadcasting System at 8.30 p. m., E.S.T., April 1. The subject will be "Has Business Come Back?" The speakers will broadcast immediately after a conference with President Hoover. Others on the program will be G. D. Crane, Chicago, president of the National Conference of Business Paper Editors; W. W. Macon, managing editor, *Iron Age*; Virgil Jordan, economist, *Business Week*; L. W. W. Morrow, New York, editor, *Electrical World*, and Paul Aldrich, Chicago, editor, *National Provisioner*.

## N.A.C.C. Appoints Hastings

Frederick A. Hastings has been appointed to the legal staff of the legislative department of the National Automobile Chamber of Commerce, as assistant to Richard S. Armstrong. Mr. Hastings has been engaged in the general practice of law in New York for the past seven years. He will now specialize in the study of motor legislation and will be a consultant in the field activities of the Chamber.

## Stout Gets Pilot's License

William B. Stout, head of the Stout Air Lines and designer of the Ford all-metal plane, has just been granted a private flying license by the Department of Commerce. Mr. Stout, who has built hundreds of planes in the past 15 years, only recently attempted solo flying.

## Beloate Succeeds Clark

Appointment of C. E. Beloate as manager of the Pittsburgh district has been announced by J. W. Frazer, general sales manager of the Chrysler sales Corp. Mr. Beloate succeeds Latham Clark, resigned.

## Bradford Heads Traffic Club

Chester T. Bradford, manager of the traffic department of the International Harvester Co., was installed as president of the Traffic Club of Chicago, Tuesday evening, March 25.



## Exports, Imports and Reimports of the Automotive Industry for February of Current Year, and Total for Two Months Ended February, 1930

	Month of February		1930		Two Months Ended February		1930	
	1929	Value	1930	Value	1929	Value	1930	Value
<b>EXPORTS</b>								
Automobiles, parts and accessories .....	..	\$59,559,374	..	\$30,784,631	..	\$105,395,797	..	\$59,882,493
Electric trucks and passenger cars .....	3	2,444	..	..	9	11,990	7	12,627
Motor trucks and buses except electric (total) .....	19,806	11,150,708	6,750	4,677,569	32,838	19,114,429	19,626	12,294,655
Up to 1 ton, inclusive .....	15,700	6,763,918	3,235	1,787,654	25,269	10,807,168	12,091	5,779,464
Over 1 and up to 2½ tons .....	3,824	3,648,644	3,168	2,195,846	7,010	6,825,025	6,919	5,193,176
Over 2½ tons .....	282	738,146	347	694,069	559	1,482,236	616	1,325,015
<b>PASSENGER CARS</b>								
Passenger cars except electric (total) .....	33,218	23,842,196	18,732	13,071,641	57,851	41,714,311	34,025	24,145,284
Low price range \$1,000, inclusive .....	23,848	12,248,050	13,383	6,766,142	41,511	21,401,043	24,193	12,334,154
Medium price range, \$1,000 up to \$2,000 .....	8,286	9,030,680	4,765	4,964,195	14,440	15,841,659	8,659	9,065,951
High price range, over \$2,000 .....	1,084	2,563,466	584	1,341,304	1,898	4,470,799	1,173	2,745,174
<b>PARTS, ETC.</b>								
Parts, except engines and tires .....	..	..	..	..	..	..	..	..
Automobile unit assemblies .....	..	12,065,224	..	7,942,876	..	23,782,010	..	12,961,792
Automobile parts for replacement (n.e.s.) .....	..	10,185,989	..	3,508,710	..	16,803,276	..	7,971,017
Automobile accessories .....	..	1,015,998	..	546,264	..	1,794,545	..	1,086,891
Automobile service appliances (n.e.s.) .....	..	584,602	..	206,993	..	1,094,108	..	1,241,347
Trailers .....	78	27,490	69	58,840	156	79,841	130	116,666
Airplanes, seaplanes and other aircraft .....	11	122,473	14	195,750	31	416,865	31	469,939
Parts of airplanes, except engines and tires .....	..	105,756	..	141,434	..	162,854	..	339,752
<b>BICYCLES, ETC.</b>								
Bicycles .....	457	11,272	140	3,683	996	26,027	560	16,332
Motorcycles .....	1,514	352,072	1,415	338,262	3,227	741,718	2,736	643,646
Parts and accessories, except tires .....	..	130,016	..	120,218	..	213,069	..	230,681
<b>INTERNAL COMBUSTION ENGINES</b>								
Stationary and Portable .....	..	..	..	..	..	..	..	..
Diesel and Semi-Diesel .....	149	81,886	27	49,589	247	176,241	61	161,588
Other stationary and portable: .....	..	..	..	..	..	..	..	..
Not over 10 hp. ....	3,016	274,878	2,191	173,391	5,761	504,620	5,103	398,937
Over 10 hp. ....	415	139,826	115	..	702	363,188	..	..
Automobile engines for: .....	..	..	..	..	..	..	..	..
Motor trucks and buses .....	984	158,525	3,744	290,918	2,600	311,956	3,909	334,005
Passenger cars .....	10,175	1,079,978	7,588	676,888	16,521	1,784,530	10,080	927,617
Tractors .....	132	45,599	63	32,805	175	65,685	71	35,545
Aircraft .....	23	116,694	12	50,713	56	277,897	37	151,461
Accessories and parts (carburetors) .....	..	381,728	..	275,817	..	673,804	..	696,032
<b>IMPORTS</b>								
Automobiles and chassis (dutiable) .....	28	63,437	40	53,833	85	172,748	77	103,312
Other vehicles and parts for them (dutiable) .....	..	49,644	..	17,654	..	209,784	..	39,420
<b>REIMPORTS</b>								
Automobiles (free from duty) .....	20	27,148	19	30,548	45	84,084	37	43,666

### Has New Aircraft Engine

MARYSVILLE, MICH., March 25—American Cirrus Engines, Inc., associated with Allied Motor Industries, Inc., has announced a new air-cooled, four-inline airplane motor of the inverted type. This engine weighs 273 pounds and develops 95 hp. at 2100 r.p.m. It is known as the American Hi-Drive Ensign and the company claims for it the advantage of permitting high mounting of the propeller with a consequent clear vision for the pilot and more perfect streamline. The engine permits that the propeller shaft be raised eight to 18 inches above the shaft of a radial motor of similar type and permits the lowering of the landing gear by an equal number of inches.

The bore of this engine is 4.33 and the stroke 5.125, giving a piston displacement of 302 cu. in. The compression ratio is 5.4 to 1. Pistons are of aluminum alloy and connecting rods are made of forged heat treated aluminum alloy.

### Plymouth Arouses Interest

DETROIT, March 24—In four days, recently, 684 applications asking information on Chrysler dealers' franchises were received at the offices of the Chrysler Sales Corp., according to officials. This volume of applications is attributed by the company to the recent introduction of the Chrysler Six and the recent price reductions on the Plymouth.

### N. J. Registrations Drop

NEW YORK, March 24—New car registrations in New Jersey during February totaled 7493 as compared with 8067 in January and with 8118 in Feb-

ruary of the previous year, according to Sherlock & Arnold. Total new car registrations for the year at the end of February were 15,560 as compared with 13,181 in the corresponding two months of last year.

### Stromberg Plant Being Fitted

CHICAGO, March 26—Operations in the new \$250,000 plant of the Stromberg Motor Devices, Inc., a division of the Bendix Aviation Corp., at South Bend, Ind., are under way and men are being hired as rapidly as the machinery is installed. When all of the equipment is in place about 1000 persons will be employed. The building, which is constructed of steel throughout and has a concrete roof, is 350 ft. wide and 900 ft. long, inclusive of the foundry.

### Radio Opposition Tabled

SPRINGFIELD, MASS., March 25—Tabling by the Massachusetts Board of Public Works of an order of George A. Parker, registrar of motor vehicles, to forbid operation of cars equipped with radio sets is regarded as evidence of the collapse of the opposition to the use of such sets. At a recent hearing by the board, opinions expressed are said to have been almost unanimously in favor of permitting the use of such equipment.

### Galesburg Sales Gain

CHICAGO, March 24—Sales of the Galesburg division of the Ingersoll Steel & Disc Co., subsidiary of Borg-Warner Corp., were larger in February than in the corresponding month of any previous year, C. S. Davis, president of Borg-Warner, said today. This year's sales were 9 per cent ahead of February, 1929.

### Barnes Sees Healthy Year

WASHINGTON, March 27—February production of 359,000 automobiles would indicate on average seasonal trends a 1930 production of about 4,600,000 cars, according to a summary on business conditions made by Julius Barnes, chairman of the National Business Survey Conference. Current reports, he stated, indicate increasing automotive production. Dealers' new car stocks are reported low. February payrolls exceeded January by 25 per cent, and exceeded December by 28 per cent. Stocks of gasoline on March 8 equaled 58 days' supply, and have led to a suggestion of the Federal Oil Conservation Board that the refining industry reduce operations to a six-day basis. Refining and production, by reason of conservation efforts, show a decrease with a resulting relief from accumulation. Prices have steadied.

### Steam Bus Operating

PHILADELPHIA, March 24—It was announced that the steam bus of the Delling Motors Co., which was described in *Automotive Industries* of Dec. 9, 1928, has been in regular passenger service between Philadelphia and Atlantic City since last November and has covered about 40,000 miles.

### Auburn Exports Increase

AUBURN, IND., March 24—Export shipments of Auburn Automobile Co. increased 12 per cent during the first quarter of the fiscal year 1930, ended Feb. 28, over the final quarter of 1929, R. H. Faulkner, vice-president, said today. Total export shipments of 468 compared with a total of 417 for the period ended Nov. 30, 1929.



## Finds Drying Processes Causes Car Body Squeaks

Repair Specialist Addresses S.A.E.  
Section Meeting in Detroit

DETROIT, March 25—"Many of the squeaks and rattles which develop in motor car bodies are directly traceable to the ovens used for drying the finish coatings," said Ralph E. Bills, president, Ralph E. Bills Body Co., Detroit body repair specialist, at a meeting of the Body Division, Detroit Section, S.A.E., last night. "The high temperatures maintained in the final drying ovens," explained Mr. Bills, "result in drying out the wood unless the proper humidity is maintained. In addition the drying out of the glue results in loosened joints which may quickly develop squeaks."

Other suggestions made by Mr. Bills, to improve body design, included:

1. Substitution of stationary instead of ventilating windshields, especially of the swinging type, to prevent drafts. Experience has shown, according to Mr. Bills, that windshields are but rarely opened.
2. Move door hinges closer in to prevent door sag.
3. Provide take-up mechanism, for wear, on door locks, to remove this annoying general source of rattles.
4. Adoption of metal window channels with a spring take-up, to prevent rattles. Of those used at present, Mr. Bills stated the felt-covered rubber were most satisfactory, but wore out too fast.
5. Watch shimming under bodies more closely to insure good door fits and prevent sagging. Use rubber shims.

## G.M. Executives Sail

NEW YORK March 26—E. M. Van Voorhees, recently appointed managing director of General Motors Brazil; L. W. Tomlin, analyst on the staff of J. D. Mooney, president of General Motors Export Co., and D. E. Hardy, recently appointed assistant to the managing director of General Motors Brazil, Sao Paulo, sailed on the S. S. American Legion for Sao Palo last week.

Other moves of General Motors Export personnel include the departure this week of A. Lincoln Cooper, color adviser, on the S. S. Eastern Prince, to visit the plant in Buenos Aires, Rio de Janeiro and Montevideo; the return to this country of F. C. Lynch, attached to the European Regional Headquarters in Paris, who has been in Madrid for the past year on a special assignment to General Motors Peninsular, and W. L. Carver of the staff of Mr. Mooney, who has been on a special assignment in Europe, and the departure of H. L. Vinsen, Vauxhall specialist for Australia, who has been on a visit to the home offices of the company.

## Durant Sales Gain

DETROIT, March 26—Marked improvement in sales of Durant motor cars and Rugby trucks in New England

and requests from distributors in that district for greatly increased shipments of new cars for April are reported by R. T. Hodgkins, general sales manager of Durant Motors.

## Rubber Consumption Gains

NEW YORK, March 25—Manufacturers of tires and tire sundries consumed 361,803 long tons of crude rubber, producing merchandise to the value of \$703,027,000 in 1929, according to statistics compiled by the Rubber Manufacturers Association from its quarterly questionnaire. This compares with 348,339 tons consumed in 1928 to produce merchandise valued at \$771,066,000. This is a part of the 429,157 tons consumed by the entire rubber industry in 1929 to produce merchandise valued at \$1,055,165,000, as compared with 406,849 tons consumed in 1928 by the entire industry to produce merchandise valued at \$1,099,790,000.

## Auto-Lite Reelects Officers

TOLEDO, March 25—Directors and officers of the Electric Auto-Lite Co. were reelected at the annual meeting of stockholders here today. President Clement O. Miniger reaffirmed his belief that 1930 would be an excellent year for the automotive industry.

## Cities Need of Fast Distribution

NEW YORK, March 26—The key to success in today's high pressure competition is rapid distribution, Edward F. Loomis, secretary of the Motor Truck Committee of the National Automobile Chamber of Commerce, told the Connecticut Chamber of Commerce at a luncheon meeting this week when he addressed them on Industry's Dependence on Commercial Motor Transportation.

## Replacement Parts Sales Expected to Make Record

National Automotive Parts Association  
Sponsors This View

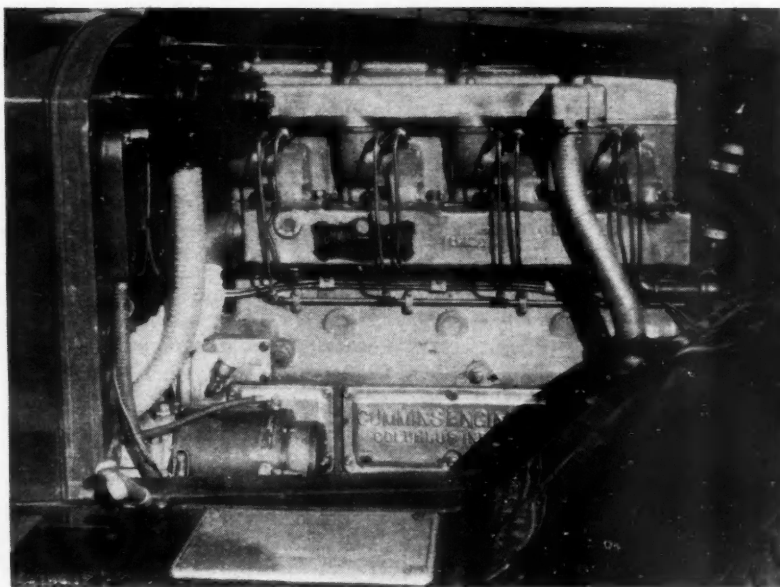
DETROIT, March 27—The year 1930 not only is away to a flying start toward a record-breaking volume in replacement parts sales, but it will witness a wholesome, stabilizing effect on general replacement parts distribution.

This is the future glimpsed by headquarters of the National Automotive Parts Association in Detroit, based on business done during December, January and February. In a statement issued this week by Charles H. Davis, executive secretary of this distributing organization, total N.A.P.A. sales in the United States and Canada during December, 1929, showed a gain of only 10.3 per cent over the preceding December, while January, 1930, showed a total net gain of 18.7 per cent, and February a gain of 22.4 per cent over the corresponding months a year ago.

"While figures for March are not yet available, advance information from our manufacturing sources indicate that March easily will prove another record-breaking month in shipments to our warehouse units," the statement continued. "In view of the unusually long, severe winter and the depression not only in the automotive industry, but in general business, we find genuine cause for optimism in the upward trend of our own sales curve."

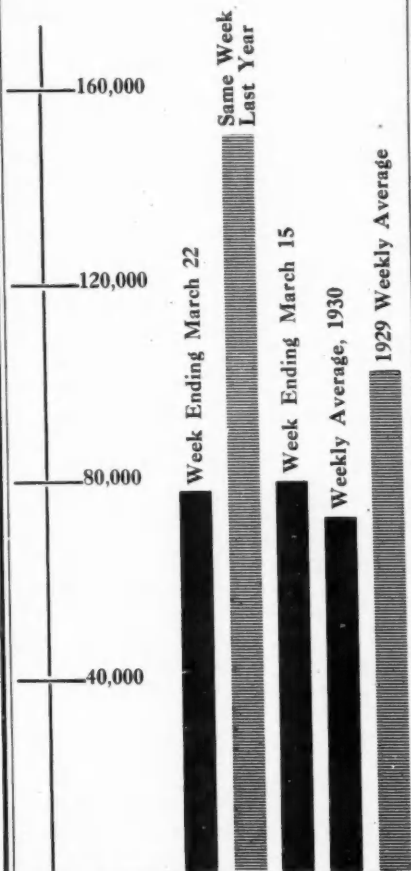
"With new car production curtailed during 1930, as seems to be the foregone conclusion of leaders in the industry, we will find in the vehicles already on the road a potentially increased market for vital repair parts. Regardless of new car production, motor transportation must be maintained."

## Cummins Diesel Average 80 m.p.h.



C. L. Cummins, in a car equipped with this Diesel engine of his design, drove South on the Daytona Beach trial course last Thursday, making a mile in 43.89 seconds, a speed of 82.116 m.p.h. He drove North against the wind at the rate of a mile in 45.93 seconds, a speed of 78.975 m.p.h. The average for both directions was 80.204 m.p.h. He drove from Columbus, Ind., to the beach and back again, covering the 2550 miles at an average speed of 42 m.p.h. The total fuel cost was \$4.75, he reported

### Automotive Industries Production Chart Weekly



The composite chart appearing above will delineate each week production of passenger cars in the United States and Canada, for the week preceding publication of the issue in which it appears, together with production for the preceding week, and other factors. Data used in compiling it are obtained in confidence from a number of sources. Other factors may be added, dependent upon the cooperation of additional sources of information.

amounted to \$1,724,846. This is an increase of more than 47 per cent over January sales, and more than 186 per cent over the sales for December of last year. Total sales for the first two months of 1930 were \$2,897,769. February was the largest month since August of last year. March sales, with the last few days estimated, will show a substantial gain over February, indicating a satisfactory upward trend in the company's business.

### Merger of Six Companies Under New Era Rumored

CLEVELAND, March 27—John McArdle, vice-president of the Jordan Motor Car Co., said that his concern has been approached by A. M. Andrews, president of New Era Motors, Inc., in the interest of a proposed merger with the Cleveland company and several other concerns. Among other companies mentioned in this proposal were Kissel, Gardner, Moon and Stutz, although denial of such plans on the part of the latter company were continued by Col. E. S. Gorrell, president of the latter company.

New Era Motors continues to operate as a holding company, holding Moon shares which were given for the purchase of the Ruxton interests.

"We are considering Mr. Andrews' proposal tentatively, but have reached no decision," Mr. McArdle said.

Newspaper reports stated that New Era had purchased Kissel Car, although no confirmation had been made of this move.

### DO-X to Tackle Atlantic

NEW YORK, March 26—The giant DO-X seaplane will fly from Lake Constance to the United States late in June or July, according to announcement made in New York today. It will bring a crew of 12 and will probably carry 50 passengers. The Siemens & Halske Jupiter radial engines will be replaced by 12 Curtiss Conquerors, which will give it 7200 hp. instead of 6000 hp.

### Original Equipment Shows Gain During February

But M. & E. A. Index Was Below Same Month Last Year

NEW YORK, March 25—Manufacturers of original equipment showed some improvement in February as compared with January, according to monthly index figures prepared by the Motor & Equipment Association, although still falling far below February a year ago. This group of manufacturers established an index for February of 141, taking January, 1925, as 100, compared with 135 in January of this year and 243 in February, 1929.

Service parts index for the month fell below January as well as below February a year ago, being 131 as compared with 137 and 136 respectively for the other two months in comparison.

Accessories continue in a position of comparatively slight sales with an index of 66 as compared with 79 in January and 69 in February of last year.

Service equipment showed some improvement over the early part of the year, but this group also fell below volume for the previous year. Service equipment index for the month was 151 as compared with 135 in January and 192 in February, 1929.

Grand index for all manufacturing divisions of the associations was 138 in February as compared with 132 in January and 212 in February, 1929.

Sales of wholesalers during the month also established a rather marked decrease, with collections on the part of wholesalers reduced.

### Reo Promotes Eldridge

NEW YORK, March 27—Clarence E. Eldridge, sales manager of the Reo Motor Car Co., has been promoted to assistant general manager in charge of general assignments, and Elijah G. Poxson, formerly assistant general sales manager, has been named general sales manager of Reo.

### Peerless Financing Completed

CLEVELAND, March 24—Completion of the financing plan of the Peerless Motor Car Corp. which has been sponsored by powerful Cleveland and eastern capital will provide in excess of \$2,000,000 additional working capital for the company, it was announced today.

The plan calls for the offering of 100 per cent additional common, or 258,598 shares, the amount now outstanding, to stockholders at the rate of \$8 per share on a share for share basis. J. A. Bohannon, president, states that the additional funds are to be utilized in a general expansion program.

### Budd Wheel Sales Gain

NEW YORK, March 26—February sales of Budd Wheel Co. of Philadelphia and Detroit, according to announcement by H. A. Coward, secretary,

## Rubber Invoiced to U. S.

WASHINGTON, March 25—American consular officers at Singapore, Penang, Colombo, Batavia, Surabaya, Medan, London and Liverpool, who vise invoices on all rubber shipped to the United States from Malaya, Ceylon, Netherland East Indies, and the United Kingdom, report by cable the following amounts of rubber invoiced during the week ended March 22, 1930, as compared to amounts invoiced in 10 preceding weeks:

1930	Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	TOTAL
Jan. 11.....		7,235	931	1,469	15	9,650
Jan. 18.....		7,009	898	1,560	49	9,516
Jan. 25.....		9,212	1,103	2,051	14	12,380
Feb. 1.....		5,078	1,213	1,679	98	8,068
Feb. 8.....		9,902	1,788	2,572	31	14,293
Feb. 15.....		7,223	1,312	1,315	59	9,909
Feb. 22.....		7,010	1,223	2,389	51	10,673
March 1.....		8,146	2,315	2,898	57	13,416
March 8.....		6,637	925	1,990	45	9,597
March 15.....		6,256	658	1,786	10	8,710
March 22.....		7,075	753	1,997	19	9,844

All figures in long tons.



## First Quarter Building Compares Well with 1929

### Parts and Body Makers' Expansions Largest Item

PHILADELPHIA, March 27—As the first quarter closes, total projected building and enlargement programs announced in the automotive and aeronautical field showed a favorable comparison with the first quarter totals for 1929.

Airport construction jobs showed a drop. On the other hand, factory and assembly plants in this field showed a gain in number of projects proposed and the total amount to be expended.

Garage construction, including service stations, continued to show an increase over previous months this year and during the latter part of last year.

Most of the factory announcements, construction and enlargement projects announced during the first quarter this year have been made by parts and body builders. Few automobile plants have figured in the reports. Among the reports made to *Automotive Industries* this week were:

**Gordon Body Co.**, Indianapolis (automobile bodies), asked bids on contract for a plant to cost about \$30,000 with equipment. W. A. Lyons is manager of construction, in charge.

**Indianapolis Board of Works** has authorized erection of combination hangar and administration building at Ben Davis municipal airport, including repair and reconditioning facilities, to cost \$137,000 with equipment. Other hangar units are planned. Paul H. Moore is superintendent at airport.

**Notre Dame University Board of Trustees**, South Bend, has plans for new engineering building, to cost about \$70,000 with equipment.

**Fairfax Airport, Inc.**, Kansas City, Mo., a subsidiary of Woods Bros., Inc., manufacturer of aircraft, plans new terminal building, with repair and reconditioning facilities, at Rosecrans Field, St. Joseph, Mo., to cost about \$60,000. Walter Beschen, St. Joseph, architect.

**Cessna Aircraft Co.**, Wichita, Kan. (airplanes and parts), is arranging for reorganization including increase in capital from \$500,000 to \$1,000,000, part of proceeds to be used for expansion.

**Armstrong-Siddeley Co.**, Coventry, England, contemplates erection of a plant at Britannia, Ont., to build airplanes. Ottawa Car Mfg. Co., Ottawa, Ont., is Canadian representative.

**Ellensburg (Wash.) Building Corp.**, and Washington Motor Coach Co., are planning a motor coach terminal for Ellensburg to cost about \$100,000.

**Central Chevrolet Co.**, Omak, Wash., will build a garage to cost \$17,500 this spring.

**Yellow Cab Co.**, Spokane, Wash., is erecting a brick and concrete garage, 50 x 142 ft., for servicing and storing its cabs and ambulances. Cost will be \$15,000.

## Ohio Employment Below Last Year

COLUMBUS, OHIO, March 24—The Bureau of Business Research of Ohio State University in a bulletin covering employment in the automobile and automotive parts industries in Ohio shows that February employment was 4 per cent greater than in January but was 40 per cent less than in February, 1929. Of the 46 reporting concerns, 29 showed increases in February employment over January, and 17 showed decreases. Average employment during the first 2 months of 1930 was 34 per cent less than during the same period in 1929.

**Interstate Coach Co.**, Spokane, Wash., is planning a brick garage to cost \$40,000.

**General Alloy Co.**, Newark, plans addition to cost \$35,000 with equipment. Paul B. West, architect.

**Berliner-Joyce Aircraft Corp.**, Baltimore (airplanes and parts), is arranging merger with Douglas Aircraft Co., Inc., Santa Monica, Cal., manufacturer of aircraft, and is negotiating for \$200,000 part of fund to be used for expansion and operations.

**Electric Storage Battery Co.**, Philadelphia, awarded contract to William Steele & Sons Co., for addition to cost \$25,000 with equipment.

**Autocar Co.**, Ardmore, Pa. (motor trucks), arranged preferred stock issue to total \$1,071,200, part of fund to be used for expansion and operations.

**Ford Motor Co.**, Dearborn, has selected site on waterfront near East Marginal Way, Seattle, for new assembling plant, to cost over \$2,000,000 with equipment.

**Alliance Aircraft Corp.** stockholders, Alliance, Ohio, are organizing the Warrior Aeronautical Corp., to take over and operate local plant, which has been idle since last December. New company will arrange for financing and plans to resume production soon.

**Thompson Products, Inc.**, Cleveland (valves, pistons, etc.), plans addition to cost over \$80,000 with equipment. Unit is for production of new line of engine valves.

**Milwaukee Die Casting Co.**, Milwaukee, plans new shop group on new site, 330 x 470 ft., recently acquired on Holton St. First unit will provide 45,000 sq. ft. compared with 20,000 sq. ft. in present plant. Work probably will begin about July 1.

**International Harvester Co.** contemplates erection of an addition to tractor plant at Milwaukee, and is considering plans. Work is under way on remodeling and enlargement of the present shop unit, at cost of \$35,000. C. P. Rasmussen, chief engineer.

**A. O. Smith Corp.**, Milwaukee, has engaged Holabird & Root, architects, Chicago, to design new eight-story administration building and research laboratories. It is planned to start work early in May. E. W. Burgess is chief plant layout engineer.

## Orders From Car Makers Steady Steel Operations

### Reserve Stocks at Factories Appear to Be Low

NEW YORK, March 27—Incoming orders from motor car manufacturers and parts makers permit of a more steady rate of operations in finishing plants catering to automotive requirements. No matter how slight the rise in output by individual automotive manufacturers may be, it is quickly reflected in their steel commitments, reserve stocks being virtually nil. Quite a little business has been placed for body and fender stock for April shipment. Steel bar and automotive alloy steel demand also shows more activity. Virtually no commitments beyond April have come out so far.

The price situation is a shade steadier. Some fairly good-sized orders for full-finished automobile sheets are reported to have been booked at 3.90 cents, Pittsburgh. A fortnight ago there was much talk of certain buyers having been able to shade this price. Inquiry for hot-rolled strip steel also has turned more encouraging. Cold-rolled material is still moving slowly, and on round tonnages buyers are usually able to shade the 2.65 cents, Pittsburgh or Cleveland, figure. Cold-finished steel bars move in a routine way in very small lots, buyers bringing little pressure to bear on price and ordering material as they need it.

Second-quarter business for sheet bars and other descriptions of semi-finished steel is being taken at first-quarter prices. The market for manufacturers' wire and wire products is a shade steadier. No change is noted in the rate at which bolts and nuts are being taken and prices are unaltered.

**Pig Iron**—Competition among blast furnaces for automotive foundry business is keen. The Michigan market is more nearly \$19.50 now as compared with the \$20 quotation in vogue until the middle of the month. The Valley market is quoted at \$18.50 for foundry No. 2 and \$19 for malleable.

**Aluminum**—The market is quiet. Price levels continue unchanged.

**Copper**—The movement of copper into home consumption continues slow, but foreign demand has given fair support to prices which remain unchanged, with a negligible tonnage of electrolytic being offered in the "outside" market at a shade under producer's quotation.

**Tin**—This metal has recovered part of the ground it lost during the recent slump which now appears to have definitely ended. Favorable end-of-the-month statistics are looked for. Straits sold at the opening of the week at close to 33 cents.

**Lead**—The market is more active with the undertone firmer. Producers are well sold ahead.

**Zinc**—Easy. Demand moderate.

### Thermoid on 7-Day Schedule

TRENTON, N. J., March 26—The Thermoid Rubber Co. is operating seven days a week in the automotive parts department. The company is working on large orders for automobile brake lining for an automobile concern.



## Tire Production Below Month of January, 1929

Manufacturers Reports Show Gain  
Over December

NEW YORK, March 24—Increased production of tires was registered during January, although January production in most cases fell below January a year ago, according to figures compiled by the Rubber Manufacturers Association. Shipments also increased in most cases, so much so that inventories of inner tubes showed a decrease during the month although inventories of pneumatic cases were higher than they were during the previous month. The only instance in which production fell below December was in the case of high pressure tubes, where the January production was 783,709 as compared with 884,904 in December. These figures are based on reports furnished by manufacturers producing approximately 75 per cent of the total for the United States. Comparative figures follow:

### PNEUMATIC CASINGS—ALL TYPES

	Inven- tory	Produc- tion	Ship- ments
Jan. 1930.....	9,539,353	3,588,862	3,525,404
Dec. 1929.....	9,470,368	2,445,817	2,589,515
Jan. 1929.....	10,284,158	5,041,530	4,969,647

### INNER TUBES—ALL TYPES

Jan. 1930.....	10,163,267	3,685,410	3,885,717
Dec. 1929.....	10,245,365	2,787,121	2,723,035
Jan. 1929.....	11,539,395	4,887,932	5,431,255

### BALLOON CASINGS

Jan. 1930.....	7,139,154	2,779,864	2,805,740
Dec. 1929.....	7,160,127	1,783,784	1,920,396
Jan. 1929.....	6,583,958	3,470,596	3,499,121

### BALLOON INNER TUBES

Jan. 1930.....	6,911,422	2,898,682	2,992,752
Dec. 1929.....	6,889,213	1,940,789	1,952,450
Jan. 1929.....	6,805,018	3,347,660	3,630,579

### HIGH PRESSURE CORD CASINGS

Jan. 1930.....	2,382,959	804,783	713,713
Dec. 1929.....	2,290,236	659,410	663,992
Jan. 1929.....	3,651,041	1,563,554	1,461,104

### HIGH PRESSURE INNER TUBES

Jan. 1930.....	3,233,813	783,709	889,208
Dec. 1929.....	3,339,451	844,904	768,331
Jan. 1929.....	4,734,477	1,540,272	1,800,676

## Edward B. Gallagher

DETROIT, March 22—Edward B. Gallagher, 54 years old, for several years a superintendent at the Wilson Foundry & Machine Co., Pontiac, Mich., was found dead at the wheel of his automobile yesterday. Death was said to be due to a heart attack.

### Air Show Discontinued

MONTREAL, March 24—It was announced today by Adelstan Levesque, exhibition manager of the Montreal Light Aeroplane Club, Inc., that the Montreal Aircraft Exhibition scheduled to take place in the Stadium building has been discontinued. He stated that the aero engine and aircraft manufacturers' section of the Canadian Manufacturers Association have decided that none of their members will exhibit planes in any aircraft show this year.

## Tire Export Lead Continued by U. S.

WASHINGTON, March 24—Throughout the year 1929 the United States continued to hold its supremacy in the world's tire trade, leading its nearest competitor, Canada, by a wide margin, according to the Rubber Division, Department of Commerce. Eight countries—the United States, Canada, France, the United Kingdom, Italy, Belgium, Germany, and Japan—continued during 1929 to supply the bulk of the foreign tire consumption of the world. With the exception of France, all countries experienced gains in exports over 1928.

## Service is Topic

NEW YORK, March 24—Service was the subject of the March meeting of the Metropolitan Section of the Society of Automotive Engineers held last week at the \$2,000,000 service station of the Packard Motor Car Co. of New York.

Oscar A. Eskuche, service manager of Warren-Nash, discussed the relationship of design to service and made a plea for greater accessibility of parts requiring frequent service. He enumerated a number of cases where the designer, in his efforts to reduce production costs, has placed parts frequently requiring service in such inaccessible positions as to make the servicing of these parts an expensive and difficult proposition. The flat rate system, he said, has reacted on designers to make service somewhat more possible than it was heretofore.

## Peerless Issue Underwritten

CLEVELAND, March 24—J. A. Bohannon, president of the Peerless Motor Car Corp., announced today that through collaboration of Cleveland and eastern capital a proposed stock offering had been underwritten up to 125,000 shares, assuring the corporation of a substantial addition to its working capital. The program will be voted on at stockholders' meeting to be held April 1, at which time present stockholders are offered the right to subscribe for additional stock on a share for share basis at the rate of \$8 per share. The proposed plan will supersede the stock option given to the present management last August, the management having agreed to waive its right to give effect to the present plan.

### Plans National Diesel Meeting

NEW YORK, March 24—The Oil and Gas Power Division of the American Society of Mechanical Engineers will hold its third annual national meeting at State College, Pa., June 12-14. Among the numerous papers scheduled is one on "Progress in Oil Engine Spray Research at State College," and another on "Torsional Oscillations of Diesel Engine Crankshafts."

## Business in Brief

Written by the Guaranty Trust  
Co., New York, exclusively for  
AUTOMOTIVE INDUSTRIES.

NEW YORK, March 26—Industrial activity and the level of employment still fail to show definite signs of revival. There was some increase in spring trade last week, but the most outstanding feature of that period was a sharp increase in the prices of grain and cotton. Ordinary building continues slow, although the lumber and paint trades have recently shown some improvement.

### CHAIN STORE PROFITS

A recent report of the profits of 53 representative store chains in 1929 showed an increase above those in 1928 greater than the gain in 1928 above those in 1927. This is particularly noteworthy in view of the general trade recession last November and December, for these two months are usually the most profitable for retail trade.

### FREIGHT CAR LOADINGS

Railway freight loadings for the week ended March 8 totaled 873,548 cars, which marks a decline of 73,991 cars below those a year ago and a decline of 78,008 below those two years ago.

### FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended March 22 stood at 90.7, as against 90.9 the week before and 91.0 two weeks before.

### BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended March 19 were 14 per cent below those in the corresponding week last year.

### STOCK MARKET

Easy money conditions last week, with call money ranging from 2 to 3½ per cent, had a stimulating influence on the stock market. Although there were a few exceptions, prices generally moved to appreciably higher levels. The volume of business was large, transactions on four days of the week exceeding 4,000,000 shares.

### BROKERS' LOANS

After a combined increase during the two preceding weeks of \$231,000,000, brokers' loans in New York City for the week ended March 19 increased \$121,000,000, bringing the total up to \$3,841,000,000, as against \$5,793,000,000 a year ago.

### FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended March 19 showed decreases of \$60,700,000 in holdings of discounted bills, of \$71,500,000 in holdings of bills bought in the open market, and of \$63,400,000 in member bank reserve deposits. Holdings of Government securities increased \$47,300,000. The reserve ratio on March 19 was 82.5 per cent, as against 80.8 per cent a week earlier and 79.8 per cent two weeks earlier.

# British Production and Registration Summarized

LONDON, March 15—The annual statistical survey of British passenger car production compiled by the *Motor Trader*, London, and based upon figures supplied in strict confidence, so far as they concern individual manufacturers, shows that the estimate of production made on behalf of *Automotive Industries* and published in the Statistical issue of Feb. 22, was correct

	No. of Cars Produced	Estimated Value in £
1922 .....	38,000	20,500,000
1923 .....	67,000	24,000,000
1924 .....	107,000	36,500,000
1925 .....	133,500	41,566,000
1926 .....	158,699	43,161,945
1927 .....	161,920	43,550,561
1928 .....	154,495	38,763,946
1929 .....	180,426	44,945,918

Concentration of production is a feature brought to light by the survey, for it is stated that 140,000 of the 180,000 cars produced were made by five firms; the names of the latter are not divulged, but it can be assumed that the first three are Morris, Austin and Singer. Nine firms are said to have accounted for all except 20,000 of the aggregate output.

As shown by the following table published in the *Motor Trader*, cars of 10 hp. or less predominate in popular demand, and to an increased extent as compared with 1928. This table also indicates the ratio of production to new car registrations, though it must be noted that the latter include imported cars in all sizes (a proportion of French and Italian, for instance, in the smaller sizes).

British Output 1928-1929 and New Cars of All Nationalities Registered in Each Year

	1929	1928
	British Output	New Registrations
10 hp. or less.....	73,289	58,861
12 hp. ....	45,364	30,108
14 hp. ....	22,035	21,562
16 hp. ....	24,758	27,299
18-25 hp. ....	14,200	23,084
Over 25 hp. ....	780	5,411

within 2 per cent of the estimate.

Exclusive of assemblies of imported parts, the *Motor Trader* survey gives British production as 180,426 cars, value approximately £45,000,000. This represents an increase from 154,495 and £39,000,000 in 1928. The ratio of export to production is stated to be 18 per cent, as against the 7.4 per cent applying to American production (as shown in *Automotive Industries*, Feb. 22, p. 271), though the *Motor Trader* puts the latter at 14 per cent.

Table of Average Prices of British Cars 1929, 1928 and 1927

	1929		1928		1927	
Class	Average Price	Percent- age of Output	Average Price	Percent- age of Output	Average Price	Percent- age of Output
	£		£		£	
10 hp. ....	155	40.6	156	32.6	165	24.2
12 hp. ....	208	25.1	199	33.5	213	43.2
14 hp. ....	234	12.2	277	17.4	306	19.8
16 hp. ....	391	13.7	430	8.0	473	6.8
18-25 hp. ....	558	7.8	542	7.5	649	5.4
Over 25 hp. ....	1,622	0.4	1,425	0.6	1,443	0.6

## N.S.P.A. Convention Plans

DETROIT, March 24—R. Macfee, secretary of the National Standard Parts Association, Detroit, returning from a conference with the Cleveland Convention Bureau, reports that preliminary arrangements for the sixth annual N.S.P.A. show to be staged in Cleveland at the Public Auditorium, Nov. 17-21 inclusive, have been completed. Seven hotels have been taken over for the week to provide for an expected 8000 guests. N.S.P.A. headquarters will be maintained at the Hollenden Hotel.

Present plans call for a minimum of 125,000 sq. ft. of floor space to be available for exhibitors. This will include the main auditorium, arena, arcade and west wing. Indications are, however, that about 150,000 sq. ft. will be required, according to Mr. Macfee, who has directed the N.S.P.A. shows annually for the past five years.

## Henry Paulman

CHICAGO, March 24—Henry Paulman, a pioneer of Motor Row on South Michigan Ave., died last week at his home here after an illness of six months from heart disease. For 25 years, from 1901 to 1926, he was agent for the Pierce-Arrow line here. He was at one time president of the Chicago Auto Trade Association, and pioneered in its

founding. More recently, he had been engaged in the real estate business. Mr. Paulman was well-known throughout the city and the state of Illinois, for his activity in promoting good roads. He is survived by his widow, two daughters and a son. Funeral services were held Saturday afternoon.

## Lockheed Model Approved

DETROIT, March 24—The Lockheed Division of Detroit Aircraft has announced that it has received an approved type certificate No. 300 of the new low-wing Lockheed-Sirius. Col. Chas. A. Lindbergh conducted the Department of Commerce tests in the ship of this type that he recently purchased.

## Studebaker Adds Victoria

SOUTH BEND, March 24—Studebaker now offers a new five-passenger State Victoria on the President Eight 135-in. wheelbase series. This new model, priced at \$2,295 at the factory, is equipped with six wire wheels and a folding luggage grid.

## Duesenberg Gets Foreign Orders

INDIANAPOLIS, March 24—Foreign orders totaling approximately \$250,000 have been received by Duesenberg, Inc., subsidiary of Auburn Automobile Co., since Dec. 1, beginning of the fiscal year 1930, H. T. Ames, vice-president, reported today.

## Macauley Denies Rumor

DETROIT, March 24—Rumors that the Packard Motor Co. would grant manufacturing rights for the newly developed Diesel engine to other companies, and which apparently originated in New York, were denied last week by Alvan Macauley, president of Packard.

"It would be a most illogical step for us to take," Macauley said. "We have already invested more than \$1,500,000 in a new plant for the manufacture of this motor ourselves."

"The plant now in production is such that it can supply as many engines as the aviation industry may require."

## Arrow Has New Model

HAVELOCK, NEB., March 25—Arrow Aircraft & Motors Corporation announces a second Arrow Tangerine, powered by the LeBlond 85 hp. motor, which is designated as model No. 66. The other Arrow Tangerine model No. 77 is powered by the Lambert 90 hp. motor. Each model will sell at \$3,535.

## Briggs Gets Safety Trophy

DETROIT, March 24—The Frederick J. Haynes trophy for industrial safety was awarded to the Briggs Mfg. Co., Meldrum Plant, by the Detroit Industrial Safety Council, Wednesday evening, March 19.



## National Battery Men to Meet in Chicago

Convention Has Been Planned for  
April 24-28

NEW YORK, March 24—The National Battery Manufacturers Association will hold its annual convention at the Hotel Sherman, Chicago, April 24 to 28.

Among the speakers at this meeting will be George F. Brown of the George F. Brown Co., on Lower Insurance Costs; Harry G. Moock of Moock, Lewis & Ballard, on What is the Battery Dealer Thinking About? McConnel Shank of B. F. Goodrich Co., on Battery Containers and Covers; H. B. Jameson of Arrow Mills Co., on Separators; W. H. Miller of The H. H. Robertson Co., on Sealing Compound; Dewey Farris of Whitaker Battery Supply Co., on Battery Cables; D. B. Murray of Eagle-Picher Lead Co., on Lead Oxides; J. O. McKenzie of J. O. McKenzie & Co., on Current Problems in Merchandising, and a speaker to be selected later on Sulphuric Acid.

### Detroit Aircraft Office Moved

DETROIT, March 24—Executive offices of the Detroit Aircraft Corp. have been moved from the Union Trust Bldg. to Plant No. 4 of the company at West Fort St. and Campau in Detroit. Those affected are James Work, vice-president; B. D. Adams, acting general sales manager; Karl Betts, assistant general sales manager; Pat Murphy, executive staff; Mark A. Kearney, manager of the Gliders Division; R. G. Gard, auditor, and their staffs. Edward S. Evans, president, will retain his office in the Union Trust Bldg.

## French Air Bill Aids Civil Pilots

WASHINGTON, March 24—A French air budget of 2,022,912,220 francs (approximately \$80,916,516) is to be voted on by the Senate after having passed the Chamber of Deputies in almost the same form as it was presented, according to a report received in the Department of Commerce from automotive trade commissioner, W. D. Finger. The principal changes made by the Chamber were a reduction of from 201,000,000 francs to 196,000,000 in the item for air line subsidies and an increase of from 7,500,000 francs to 8,500,000 francs in the item for training civil pilots.

### G. M. to Make Buses in Canada

WINDSOR, ONT., March 24—Announcement was made today by H. Henchel, sales manager of General Motors Corp. of Canada, Ltd., that a full line of yellow coaches would be made at the plant in Walkerville, Ont., and the first order is for 40 coaches for the Provincial Transport Co. of Montreal. This opens practically an entirely new industry for Canada.

### Budd Shipments Gain

PHILADELPHIA, March 24—The Edward G. Budd Mfg. Co. reports that shipments are now running at a rate which indicates an increase in March sales over February sales of close to \$1,000,000. Unfilled customers' releases on hand at the beginning of March total more than \$13,000,000 as compared with \$8,000,000 a year ago.

## Hutchinson Predicts Excellent Motor Year

Vice-President of Chrysler Sees  
Output Near 5,000,000

CHICAGO March 24—Prediction that the automotive industry would be a leader in the return of prosperity was made by B. E. Hutchinson, vice-president and treasurer of the Chrysler Corp., before a meeting of the Illinois Manufacturers Costs Association in Chicago, on Tuesday evening, March 18.

Improved conditions in the automotive industry will be an important asset in the advancement of business generally in the United States, he declared, and since the motor car industry has been one of the leaders in the return to prosperity in the past, it may be expected to be a leader again.

With the production figures of 1928 and that year as a normal year as a basis, it is anticipated that the normal increased production of motor cars for this year will be between 4,750,000 and 5,000,000. This estimate is based upon the increase in registrations in many states. The gain in Illinois during 1929 was 7 per cent. Wisconsin had a similar gain and Indiana was up 5 per cent. In California, Arizona, New Mexico and Utah there were larger increases, but this is considered a reflection of better business, due to oil discoveries and other similar developments.

### Auburn Dealer Stocks Low

AUBURN, IND., March 25—New cars in the hands of Auburn dealers now average approximately only 2.1 cars per dealer, despite the increased demand. R. H. Faulkner, vice-president of Auburn Automobile Co., reported today.

# 162,060 New Cars Were Financed in January

WASHINGTON, March 25—The number of automobiles financed during January, as reported to the Department of Commerce by 423 automobile-financing organizations, was 162,060, on which \$72,011,702 was advanced as compared with 171,205 on which \$78,410,747 was advanced in December and 152,226 on which \$74,278,753 was advanced a year ago. The volume of wholesale financing in dollars during January as reported by 153 concerns was \$53,037,361 of which 128 concerns reported \$51,006,036 for January, 1930, as compared with \$36,689,052 for January, 1929.

This summary will be subject to revision as reports are received from additional concerns. Detailed statistics are given below, by months, new cars and used cars shown separately. Some of the smaller firms found it impossible to segregate their operations; their totals are shown in the unclassified group.

### AUTOMOBILE FINANCING

1929	Total		New Cars Financed		Used Cars Financed		Unclassified	
	Number of Cars	Volume in Dollars	Number of Cars	Volume in Dollars	Number of Cars	Volume in Dollars	Number of Cars	Volume in Dollars
January	152,226	74,278,753	77,684	48,156,587	67,603	23,090,482	6,939	3,031,684
February	204,095	87,884,269	103,271	61,478,686	92,974	23,066,587	7,850	3,338,996
March	301,700	141,408,566	167,740	98,566,374	121,234	37,635,306	12,726	5,206,886
April	375,662	173,991,504	206,267	121,517,771	154,037	46,213,460	15,358	6,260,273
May	393,881	181,077,726	213,138	125,393,213	166,010	49,824,789	14,733	5,859,724
June	380,989	176,409,673	204,871	122,324,819	163,228	48,872,473	12,890	5,212,381
July	380,874	176,578,230	207,424	123,256,076	159,782	47,885,243	13,668	5,436,911
August	347,160	160,796,697	186,303	110,197,198	147,976	44,919,792	12,881	5,679,707
September	293,251	136,024,669	155,783	92,754,546	125,282	38,396,264	12,186	4,873,859
October	270,239	124,064,340	129,167	78,953,869	129,325	40,589,879	11,807	4,520,592
November	207,031	92,402,996	95,130	57,454,498	102,941	31,467,351	8,960	3,481,147
December	171,205	78,410,747	73,657	46,127,507	91,593	29,648,715	5,955	2,634,525
Total (year)	3,478,373	1,603,328,170	1,820,435	1,086,181,144	1,521,985	461,610,341	135,953	55,536,685
1930								
January	162,060	72,011,702	76,594	44,374,582	80,694	25,576,240	4,772	2,060,880



## Indian Gets Contract to Make Miniature Car

Coatalen is Elected Director at  
Stockholders' Meeting

SPRINGFIELD, MASS., March 24—Indian Motorcycle Co. has a contract with Automotive Standards, Inc., of North Bergen, N. J., to manufacture a miniature automobile called the "Red Bug," on a cost plus basis in the Indian plant, President Normal T. Bolles says. Three models of this car have been developed, selling at from \$150 to \$300. It is not for highway use, but for amusement parks and private estates. A production of 100 cars or more a month is planned, at the start.

Closing of negotiations for the manufacture of Diesel motors here under an arrangement with Louis H. Coatalen of the Sunbeam Motor Car Co., Ltd., of England, and Mr. Coatalen's election as a director of the Indian company was announced, following a stockholders' meeting March 21. An increase of the common stock of the company from 200,000 to 500,000 shares was authorized at a meeting the previous week.

## Crude Rubber Steady

NEW YORK, March 24—Reports that over 70 per cent of the British and Dutch planting interests, together with a substantial native following, have agreed to the cessation of tapping during May have resulted in a steadier tone in the crude rubber market, according to F. R. Henderson Corp.

Trading has been rather quiet but prices have been somewhat buoyed up by these reports. Stocks in London have increased to 68,885 tons with stocks in Liverpool up to 20,849 tons. Arrivals at all ports of the United States during the first three weeks of March are estimated at 38,500 tons.

## Excelsior Plants in California

OAKLAND, CAL., March 24—The Excelsior Radiator Co., manufacturer of replacement radiators for standard makes of automobiles, has established a branch plant here. The company is investing from \$75,000 to \$100,000 in the Oakland industry and will employ from 40 to 60 persons.

## Coming Feature Issues of Chilton Class Journal Publications

Commercial Car Journal and  
Operation & Maintenance—Special  
Truck Equipment Issue, April,  
1930.

## Test Case Decided

PARIS, March 15—Refuting the argument of the French Customs' Department the Court of Appraisals at Marseilles, judging in final appeal, has decided that purchase price on the home market, plus transportation charges, must constitute the basis on which the automobile 45 per cent import duty be applied. Acting on the instigation of automobile manufacturers, the Customs Department has sought to apply the 45 per cent import duty on retail selling price in France, minus dealers' commission and luxury tax.

As this would have involved paying duty on advertising, various overhead charges and different trading taxes, it was opposed by General Motors. This decision strengthens the plea of American importers that the present 45 per cent import duty be continued, with the aid, if necessary, of French fiscal agents in America to check factory price.

## Noblitt-Sparks Gains Orders

CHICAGO, March 24—The volume of business on the books of the Noblitt-Sparks Industries, Inc., is more than twice as large as ever before at this time of the year, it has been announced. The company is negotiating for two contracts from the automotive industry and is about to take over the manufacture and distribution of a new patented article.

## Greenfield Increasing Output

GREENFIELD, MASS., March 24—Greenfield Tap & Die Corp. is increasing its production, especially in twist drills, for which it has large orders. Increased business with the company's line of internal grinders for automotive and railroad use is reported.

## Ford Official Denies Isotta-Fraschini Deal

Newspaper Reports of Negotiations  
Are in Error, He Says

DETROIT, March 24—A report conveyed in a copyrighted cable from Rome, Italy, to the *Chicago News* to the effect that Henry Ford was negotiating for the Isotta-Fraschini Co., was denied at the Dearborn offices of the Ford Motor Co. last week. The report said that Ford had been assembling cars for several years at Trieste and planned another plant at Turin until the government decreed a 30 per cent ad valorem duty Dec. 7 on parts.

An official of the Ford Motor Co. said that he believed it was true that Isotta-Fraschini had wanted to become a partner of the Ford Motor Co., evidently not knowing that Ford has no partners and does not contemplate having any. Later, Mr. Ford was asked if he would care to buy the Isotta-Fraschini Co., but he refused. At present the Isotta-Fraschini Co. has hopes of entering into an agreement to manufacture parts for Ford.

## Federal Purchase Approved

DETROIT, March 24—The plan for acquisition by the Federal Mogul Corp., Detroit, of the Pacific Metal Bearing Co. of San Francisco through outright purchase has been approved by stockholders. The average annual income of the Pacific company, maker of replacement bearings for standard engines for the last three years, amounted to more than \$40,000. The San Francisco company will operate under the management of one of its present officers as the Pacific Metal Bearing Co., division of the Federal Mogul Corp.

## British New Car Sales Drop

LONDON, March 12—The returns of new car registrations in December last, just issued by the Ministry of Transport, show that fewer new cars were sold in that month than in December, 1928; the figures are 11,162 and 12,152 respectively. In the size classes there were, however, several increases, notably in the 15 hp. class, which showed an increase of approximately 120 per cent.

# Calendar of Coming Events

## SHOWS

Detroit (All-American Aircraft)...April 5-13  
Asbury Park, N. J., Automobile...April 7-12  
Berlin, International Automobile...Nov. 6-16

## CONVENTIONS

Society of Automotive Engineers, Aeronautic Meeting, Detroit...April 8-10  
Society of Automotive Engineers, Aeronautic Meeting, New York...May 8  
American Society Mechanical Engineers, Fiftieth Anniversary Celebration:  
New York...April 5  
Hoboken, N. J. ....April 7  
Washington, D. C. ....April 8-9  
National Council Meeting of the U. S. Chamber of Commerce, Washington...April 28

U. S. Chamber of Commerce Annual Meeting, Washington...April 28-May 1  
National Foreign Trade Conference, Los Angeles...May 21-23  
A. S. M. E., Semi-Annual Meeting, Detroit...June 9-12  
A. S. M. E., Oil, Power & Gas Div. State College, Pa. ....June 12-14  
Society of Automotive Engineers, Summer Meeting, French Lick Springs May 25-29  
World Power Conference, Berlin...June 16-25  
Railway Supply Mfrs. Assn., Meeting and Exhibit, Atlantic City...June 18-25  
American Railway Association, San Francisco...June 23-26  
American Society for Testing Materials, Annual Meeting, Atlantic City...June 23-27

Steel Founders Soc. (Midsummer Convention) White Sulphur Springs June 26-28  
National Safety Council, Annual Safety Congress, Pittsburgh...Sept. 29-Oct. 4  
Motor and Equipment Association, Convention, Cleveland...Nov. 10-14

## RACES

Daytona Beach, Fla., Speed Trials, March 15-30  
Indianapolis...May 30  
Belgium...July 5-6  
Germany (Grand Prix)...July 13  
Belgium (European Grand Prix)...July 20  
Spain...July 27  
Italy (Grand Prix)...Sept. 7  
France (Grand Prix)...Sept. 21